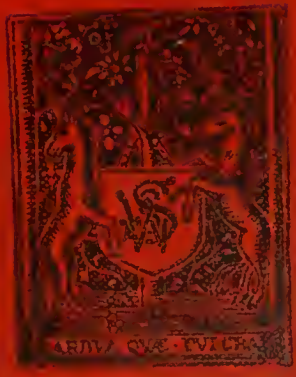
The Drink Question

DR KATE MITCHELL



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THE DRINK QUESTION:

Its Social and Medical Aspects.

BY

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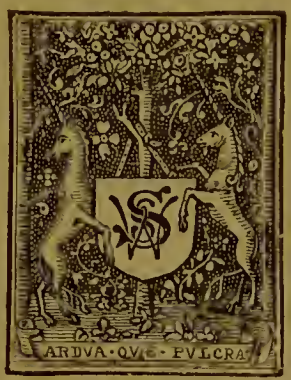

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Dedication.

To the Members of the

BRITISH WOMEN'S TEMPERANCE ASSOCIATION

I Dedicate this little Volume,

in Recognition of their Noble and Unremitting Efforts

in the Great Cause of Temperance.

CONTENTS.

The Drink Question: its Social and Medical Aspects.

CHAPTER I.

THE STATE AND SOCIETY IN THEIR RELATION TO THE DRINK QUESTION.

Civilization has brought in its train a variety of duties and obligations, social, political, and domestic, which were either quite unknown to or very imperfectly understood by our ancestors of long ages ago. As towns rose upon the outstretched plains, as villages one by one crept into existence, and as human beings began to swarm over the different countries of the earth, so arose the necessity of a more or less complicated legislature, of organized societies for the maintenance of order and peace and the protection of property and persons, and of an intricate political administration varying according to the personal habits and customs, climate, and country of each different nationality. The invention of printing alone opened up such a new and dazzling era in the life of man that hundreds found they had something to say where one alone

had patiently and toilsomely inscribed his thoughts on parchment. New ideas began to ring through the world, which, striking against each other like pieces of flint, emitted a thousand glowing sparks to illumine the truth and expose the error. Eagerness for knowledge began to reign everywhere, and a clamour arose in the air for what is called education. The more the different countries listened to and acknowledged this cry, the higher became their civilization, and the more ardent their efforts for progress and freedom. Wherever human beings have been taught to read, and write, and think, they have incurred the duties and responsibilities of citizenship, and can no longer be kept in a servile condition excepting by their own express desire. Slavery of the body is not possible with an educated human being; of slavery of the passions I shall have more to say hereafter.

It would be more than useless, nay impossible, to define the *exact* limits of a man's duties and obligations towards himself and his neighbour, and even John Stuart Mill, in his fine essay on Liberty, has not ventured to be dogmatic upon a theme which has been the bone of contention of every different nationality and government that have ever existed; but as our knowledge increases we find that human beings voluntarily take duties upon themselves, and incur responsibilities, which in the savage or semi-civilized state they would never dream of, and thus, gradually but surely, civilization with all its numerous refinements has arisen. Again, many obligations and duties are of such a subtle nature, so intimately connected with the private life an individual has created for himself, so dependent many times on personal cha-

racteristics, position in life, domestic relations, and a variety of other details, that any attempt at defining the exact limit of the law with regard to them, at least in our present imperfect state of knowledge, would lead one into a quagmire of difficulties and endless controversies of an embittered nature. But there are certain solemn duties which all educated men in a civilized community have learnt to recognise and to perform, and which, if infringed, not only cause the sorrow and distress of those whom they have learnt to love, but incur the penalty of the law. The ideals, aspirations, and ambitions of to-day are very different from those of the men and women of two or three centuries ago, aye, even of fifty years ago. Sympathies have widened out, the emotions are more highly developed, manners are more refined and sentiments less coarse. Physical pain and mental sufferings are felt far more acutely now than by those who existed in the rough and tumble times of the world's history, and we have living amongst us many millions of those who in former times would have been crushed out of existence by the survival of those best fitted to fight the world's battles. The human heart no longer beats for the family alone, it throbs for all humanity because it is being gradually educated out of an egoistic into an altruistic discernment of things. For many centuries, the dark ages of the world, muscle ruled the world and physical force reigned supreme. Food was difficult to get, and man fought for it. No tender emotions, no consideration for the weakness of others, could exist where murder was looked upon as a legitimate means of satisfying the pangs of hunger. Thus, by murder, land was got possession of and retained by the strongest, and between the holders

of one property and another everlasting feuds were carried on with a frightful amount of bloodshed.

As communities became more settled and the population of each one increased in size, the various occupations arose, and with these the mental power of man began to be developed. From a muscular animal he became a thinking animal, and the world in which he lived began to improve. The brain worked with wonderful rapidity, and in a few hundred years, a moment of time as compared with the many cycles which preceded them, it had established governments, recognised the existence of the democracy, invented printing, and drawn the four quarters of the world into the most intimate communication.

But the brain had been busy, not exactly at the expense of the heart, but careless of its existence. The individual reigned supreme, and it was almost considered a right that the strongest and healthiest alone should survive to carry on the work of the world. All those born weakly, deformed, infirm, succumbed under the hard and fast rule of a stern individualism, and the great social heart still slumbered. The true love of humanity, extending far beyond the narrow limits of the family, and embracing the whole human family, has been the outgrowth of Christianity and the moral progress of the past few centuries. The intellect has discovered the heart, and the throb of this mighty organ has brought new force into being, and has spread such an illumination over the whole social world, that only a return to the barbaric state would be able to extinguish it. With the awakening of these finer emotions, of sentiments hitherto disregarded or scoffed at, the duty towards one's neighbour has become something of a creed, and legislation

busies itself with many problems which, in former times, would have been regarded as totally unfit for the consideration of supreme assemblies gathered for the main purpose of levying taxation on a hardened and suffering people and promoting war with foreign nations. In spite of the contempt with which any appeal to the higher emotions was met, in spite of the impatience and obstinate resistance aroused by attempts to introduce questions of social reforms, yet the voice once awakened has never been quenched, and every day that passes hears it growing louder and louder, striking on each individual heart and compelling its attention. In such times grew up the men and women whose names will be remembered and revered in the history of the world, and whose works will live as the commencement of that era when the duty towards one's neighbour became a matter of sacred feeling rather than a few meaningless words. Such times produced Howard, Wilberforce, Rowland Hill, the late Earl of Shaftesbury, Mrs. Fry, Florence Nightingale, John Bright, William Lloyd Garrison, Cobden, Father Mathew, Humphry Davy, Dickens, Plimsoll, and many others, whose efforts to expose and relieve suffering and bring some amount of happiness into the darkened lives of men and woman brutalized by want and misery, ought to be regarded as worthy of everlasting homage. These men and women were the outcome of the growth of the humanitarian feeling which had been slowly developing under the influence of wider social intercourse and of a more extended education. Many were the reproaches levelled at these reformers, and loud was the outcry raised against the waste of public time which was supposed to exist in considering the many questions brought

forward by them. In some instances the opposition was so enormous that riots and civil wars were the only means of settling the subject of dispute. To abolish the frightful wrong of slavery, a whole continent was plunged in a mighty and terrible war for some years, and many living can remember the corn riots which took place here between forty and fifty years since, when bread was so dear that hundreds of the poorer classes died weekly from sheer starvation.

Individualists, or those whose emotions had not been open to this higher culture, thought that there was a great deal of sentimentalism and false philanthropy in many of the reforms proposed by these public benefactors, and they said the country was drifting to its ruin. What was the object in freeing the slave, in providing healthy prisons for criminals, in improving hospitals, and making bread cheap? What was to be gained by introducing free trade, forbidding child labour in mines, passing a poor law act, establishing cheap communication between persons separated by cruel necessity, preaching temperance reform, promoting national education, and suppressing war? Would not one and all these things mean that people were being pampered and indulged, that pauperism would increase, that vice and crime would become rampant, and that the poorer classes, until then kept in the cruel bonds of a vile subjection, would arise and put an end to the landed proprietors, the moneyed classes, the aristocracy, and even the throne itself? Evils of all kinds were prophesied by the thousand, but up to the present none of them have occurred, and on the whole we may regard with satisfaction the reforms that have been made to alleviate the condition of the

masses. The stone set rolling cannot be stopped, and the heart of humanity, once awakened, will not rest until it has attained the Millennium. Social selfishness, cruelty, neglect, and indifference must gradually disappear under a more educated and benign influence, and with this disappearance a corresponding amount of consideration for the feelings of others will grow up and diffuse itself amongst us. It is in this way that new duties, obligations, and responsibilities spring into existence, and that human beings make laws and undertake reforms for their own protection and for the protection of others, which often call down the denunciation of those who believe only in the government of self, or as a common proverb has it, "each man for himself, and the devil take the hindmost."

That this feeling is still strong amongst us, with all the progress we have made in a diametrically opposite direction, can be seen by the way in which the greatest social and scientific question of the day, the temperance question, has been treated. From the moment, over fifty years ago, that the seven men of Preston signed their bond of allegiance to abstain from all intoxicating liquors and to preach the new gospel throughout the land, the temperance cause has had one long uphill fight, and is far from the summit of the hill at the present moment. Long centuries of custom, obstinate resistance to new ideas, the individual liberty question, medical opposition, and cherished tastes had to be confronted and fought inch by inch. If the temperance question had been fighting all alone, I doubt whether it would have attained the success that it can even boast of to-day; but fortunately many other struggles which I have mentioned

were taking place at the same time, and one social reform helps another, because it is the public sentiment which is being aroused and appealed to in each case. Without the scientific knowledge which has since revolutionized the temperance question, the earlier reformers had a sufficiently strong justification for their position. The feeling of humanitarianism, more or less permeating all classes of society, especially the most intelligent and thoughtful class, had opened the eyes of a few men to a state of things arising from the consumption of alcoholic liquors, which was a disgrace to a country calling itself civilized. The first efforts made to create a public interest in the subject were attended with derision, contempt, and hatred. The beloved institution of the country—drinking—was being assailed by a few miserable *marfêtes* who, not able to enjoy life themselves, were trying to deprive others of their means of enjoyment. No contumely was too great to heap upon them, no language too violent with which to assail them; they had to bear the "whips and scorns" of an incensed and ignorant multitude. When the history of the earlier years of the temperance movement comes to be written, we shall read therein of martyrdom not unlike that suffered by the early Christians, excepting that our more advanced stage of civilization prevented actual physical torture being applied. But there were not wanting men who would have used the thumbscrew and any other instrument of torture to the hated advocates of total abstinence, if only they had had the power.

The last fifty years has witnessed a revolution in the public sentiments of the country regarding the drink question of a very encouraging and significant nature

Whereas the pioneers of the movement based their arguments mostly on the social, moral, religious, and physical effects of Alcohol upon the community, succeeding generations of enthusiastic temperance reformers have opened up the political question, and legislative measures have not only become possible, but are looked to by a large section of society as the only means by which immunity from this crying evil can be attained. With what is called legislative interference in the drink question has arisen the clamour of those individualists who detest laws and governments, and who think that human beiugs can be educated to self-government. A stubborn, unyielding, and fanatic opposition to legislation on the drink traffic has set in from the individualistic section of our society, and it is this opposition which has more or less paralysed the efforts of temperance legislators. As a very earnest and clever writer to the *Times* recently said, "Individualism has been the curse of this country"; and when we think for a moment of the appalling amount of misery, vice, and disease which have been allowed to exist and to spread because of the long reign of this deadening creed, this cold-blooded, selfish policy, thoughtful and warm-hearted people may well hesitate to deny the truth of this remark. Human beings were created to be a help unto one another; the strong to support the weak, the wise to protect the foolish, the healthy to nurture the feeble. In the former history of the world, as I have already pointed out, it was a question of "my hand against every man's, and every man's hand against me"; but as States and Governments grew into existence, society became more firmly welded together, and human beings began to be

more dependent one upon another for their social welfare and mutual protection.

The advocates of the self-government theory argue that our individual liberty is at stake when we allow the State so much latitude in the creating and the making of our laws. I say most emphatically, nothing of the kind. What, after all, is the State which makes the laws? It consists of about 670 individuals, who represent the large majority of the adult male population of this country. The State is the people. If the people want certain laws for their protection and interests, and *they are determined to have them,* these laws must be passed by their representatives. That at present the nation is unfairly represented, and that a kind of lop-sided State exists, goes without saying. As long as there are any adult males capable of independent thoughts, knowing how to read and write and earning wages, who are without their representatives in the State, so long will an unfair, unjust condition of things exist. And when one considers for a moment that more than half of the vitality of the nation is totally unrepresented at all, that women, the mothers of the human race, victims too often of unjust laws, who are keen of feeling, intellectual when given the chance of healthy, mental developments, morally superior to man (with the frank acknowledgment of man himself), then, indeed, I repeat that the State is a lop-sided affair, and requires a vast deal more moulding to bring it to perfection. Allowing for the imperfection of the State, it still represents the people, who can let their wishes be known through its medium.

I firmly believe in individual liberty, in independence

of thought, and in perfect freedom of action, so long as the action is a *self-regarding* one, and does not interfere with the rights and liberties of others. But here comes in the important and serious question, the problem which has to be solved by philosophers, thinkers, politicians, and the people themselves. Which are the self-regarding acts, and which are not? Which are the actions that rightly come within the province of the law, and which are not? Even the lucid genius of a John Stuart Mill does not always see its way clear to define the exact limits of government with regard to this question, for in one short paragraph he contradicts himself, viz.:[1] "In like manner, when a person disables himself, by conduct purely self-regarding, from the performance of some definite duty incumbent on him to the public, he is guilty of a social offence. No person ought to be punished simply for being drunk; but a soldier or a policeman should be punished for being drunk on duty. Whenever, in short, there is a definite damage, or a *definite risk of damage*, either to an individual or to the public, the case is taken out of the province of liberty and placed in that of morality or law" (the italics are mine). The author is of opinion that no person ought to be punished for simply being drunk, but in the very next sentence he says that whenever there is not only a definite damage but a *definite risk* of damage, either to an individual or to the public, the case is placed within the province of morality or the law. I would ask any unprejudiced and reasonable person whether a definite risk of damage is not attached to all forms of drunken-

[1] "Essay on Liberty." John Stuart Mill. P. 147.

ness; for my part, I scarcely know of any other physical condition, excepting insanity or hydrophobia, at which the individual or the public need be so truly and properly alarmed. Most of the horrible and brutal crimes which are a blot upon our civilization are committed in this country by persons under the influence of drink. Here, then, is an instance of a definite risk of damage to an individual or to the public. Crime is the risk attached to the state of drunkenness, and against this possibility of crime the individual and the public should be protected. Only legislation can effect this object. A drunken person is almost as dangerous to the community as a mad dog, and I cannot see what infringement of personal liberty would be involved in making it very difficult for a person to get drunk and to punish the offender when he is drunk.

Humanity is not infallible and often makes mistakes. There are bad laws in existence as well as good ones, but it should be the end and aim of each succeeding Government to learn from the failures and successes of the foregoing Government. Experience should be the great teacher of mankind, and from this source we should garner our wisdom and create our happiness. Individualism has been put upon its trial, and no longer suffices; human beings must now look to other means to redress their wrongs and relieve their sufferings. The very essence of Christianity is the development and encouragement of the social feeling—and yet how far have Christian people travelled from this ideal! In the race for wealth, in the aggrandizement of the individual, in the love of power and the pursuit of ambitious ideas, how many millions of hearts have been broken, homes destroyed,

and characters ruined. And yet what a different doctrine Christ preached! His sympathies were ever with the poor and the oppressed, the suffering and the weak, and from His mouth issued those words which should have an echo in every human heart, and which should be the watch-word of every humane Government: "Therefore all things whatsoever ye would that men should do to you, do ye even so to them." In these words lie the true Christian spirit and feeling from which human beings have turned and which they pass by wantonly and carelessly. I do not say that Christ preached Socialism, as it is understood in these days. I say that He appealed to the hearts and feelings of His followers, that He encouraged in them the development of the social sentiments which must be, after all, the foundation of all true civilization. It has taken eighteen centuries for the true spirit and essence of Christianity to be appreciated, and even now there is an obstinate resistance in the minds of a large majority of the people against understanding and applying the teachings of Christ. The Venerable Archdeacon Farrar himself, in one of his eloquent sermons, denounces in no weak language the selfish worldliness of the individualist creed. He says: ". . . I would point out that while we would religiously retain what belongs to individual liberty, we have a right as citizens that the State do for us, at our bidding, things which we have no power to do for ourselves. It is the plain duty of Governments to protect the interests of the poorest and of the weakest, who are least represented in them; to save us from that deadliest and most despicable of all forms of rule, the tyrannies of strong and united fraud; to protect men

from the wrongs of others, and, if need be, even from the vices of themselves." And again he says: "Men talk of a *laissez-faire* policy, but a *laissez-faire* policy is in plain English a do-nothing policy. In other words, it is no policy at all. And what can be truer words than these? Is it, or is it not, the duty of Governments to make it easy to do right, and difficult to do wrong? If that be grandmotherly, I say that such legislation has given us some of the noblest orders in the statute book, that it has been entirely beneficent and entirely Christ-like."[1]

In the above quotations ring the true Christian and social feeling, there breathes the spirit of humanity, there beats the heart which has felt for the suffering of men, women, and little children. It is this spirit, feeling, and heart which the enemies of the drink traffic are trying to arouse in the country, in order to stem the torrent of intemperance which has brought England to a perilous condition, and which will, if allowed to continue, ruin the manhood, womanhood, and childhood of the fairest country upon earth.

Is it striking at the roots of individual liberty, which no one respects and cherishes more than myself, to endeavour to procure the assistance of the State for the purposes of legislating on this subject? On the contrary, it is to protect the liberty of the individual that these efforts are made, which, in the long run, when the nation has clearly come to see its own true and higher interests, must be attended with success. It is only by each one consenting to give up some amount of his individual

[1] "The Duty of Governments." Ven. Archdeacon Farrar.

liberty that the liberty of all can be secured, and this sacrifice would promote a clearer understanding and a higher appreciation of the word which Englishmen have learnt to cherish above all others.

There is always a hue and cry over new ideas, especially when there is any suggestion of the application of these ideas to practical life. A new idea does not meet with an immediate response from the brains of thirty-five millions of people; it has to be hammered away at for many long and weary years before it can even be understood by the multitude, much less put into a practical shape. For one thing the great majority of the people do not become acquainted with new ideas, because their education is defective, and their means of hearing new truths very limited. The minority, who are better off in these respects, spend their time in discussing new ideas until they are threadbare, and until very little of the original is left. However, we have not to complain of that, because no new idea can be proved to be beneficial for mankind until it has been thoroughly threshed out, for, according to the great authority I have before quoted, "all silencing of discussion is an assumption of infallibility,"[1] and truth will always survive, however much it has been beaten about and misrepresented. But what I complain of is the disinclination of human beings to profit practically by a new truth (or an old truth dressed in a modern way), for fear of their individual liberty being attacked. It was long and almost universally admitted that general education would be the means of raising the people of this country from a slough of despond into a

[1] "Essay on Liberty." John Stuart Mill.

more habitable and enjoyable condition of things. Men and women groaned under the tyranny of their ignorance, but had no power to right the matter. All thoughtful people agreed that everybody should know how to read and write, in order that a greater amount of enjoyment should be got out of life than was possible in a state of ignorance. It was also admitted that knowledge would restrain vice and diminish crime. But when the whisper of *compulsory* education first fell upon the ear, a mighty storm of antagonistic feeling was aroused throughout the country, which only the persistent and patient efforts of those who advocated it were able to triumph over. A parent to be *compelled* to send his child to school, this was indeed tyranny of the worst description, a direct and unwarrantable contravention of the rights of the individual. Better far that thousands of children should remain ignorant, vicious, uncared for, and neglected, than that the individual liberty of one parent to keep his child from school, if he wished it, should be infringed. Happily the idea of universal education passed into law, and every child in the kingdom has a chance at present of becoming a better and a wiser man, a more useful citizen and respected member of society, than he had in the days of ignorance, and therefore of possible viciousness. The promoters of the Education Act knew what was meant by the term individual liberty, and respected it in giving every child a chance to use his brain freely for his own social and moral advancement.

Much more legislation of the same character and for the benefit of human beings has taken place, and we are extending it in every direction. We have heard a great deal about the superior influence of moral suasion to

make human beings do the right thing; I venture to say that had we trusted to this influence to obtain the elementary education of every child born into this land, we should have waited till Doomsday. I do not say that moral persuasion is not a powerful force, it is so with all rightminded, reasonable, and intelligent human beings, and if we only had to deal with them, legislation would scarcely be required at all; but unfortunately we have to do with the "thirty millions, mostly fools," which Carlyle dubbed his countrymen in his uncompromising fashion. Intellect now rules the world, and as this is at present in a fractional quantity (although education is fast bringing more of it to light), the wise must legislate for the unwise until the universally educated voice is heard. How many parents even now-a-days would send their children to school if they had a chance of getting out of it? Even after seventeen years' trial of the vast benefits accruing to children from the teaching of the School Boards, if the Education Acts were abolished to-morrow, thousands of parents throughout the length and breadth of the land would be only too glad not to be obliged to send their children any more to school. Ignorance is the mother of vice, and vice generates crime. As a community, then, we have a right to protect ourselves against ignorance, in order to prevent its consequences. It is far better to make laws to prevent crime than to make laws to punish crime, for in the second case it is shutting the stable door when the steed has escaped, and exhibits a weakness. A physician knows that the prevention of disease is far easier than its cure, and will also be looked upon in the future as more to his credit. The State is the physician of society, and should

seek therefore rather to prevent than to cure the evils which are in its midst. It is my contention that drunkenness is a vice (barring that condition of inebriety which is a disease, and into which I shall enter in another part of this work), one of the worst of all vices to be guarded against, and this vice is the outcome of deplorable ignorance. Socrates taught that "vice of every kind is ignorance; and involuntary, because ignorant." "If a man is intemperate," he says, "it is because he is unable to estimate the relative value of present pleasure and future pain." He also considered "virtue to be identical with knowledge." I think very few would venture to contradict the words of the wisest man that ever lived; his thoughts are the concentrated wisdom of ages, and are as full of meaning to-day as they were when they were spoken over two thousand years ago. Ignorance not only means here actual inability to read and write, but also that moral stultification of the brain which cannot distinguish between right and wrong, and which often leads an educated person to commit a vicious action. Vice is not confined to the uneducated, and is often found in highly educated persons; but in the latter, as in the former instance, it is the outcome of a moral stultification—in other words, of ignorance of the "relative value of present pleasure and future pain."

When an educated man allows himself to come under the influence of Alcohol until he is intoxicated, he is for the time being in a state of ignorance, as he cannot possibly estimate the value of the future pain which will inevitably follow his unlimited indulgence in this article. The educated man then should be as much protected from the consequence of his ignorance as the uneducated

one. The State, that is to say, the people of a country, have a right then to legislate, in as far as it is possible, against ignorance; therefore drunkenness would come within the province of such legislation. The feeling that the State possesses this right is gaining ground every day, and even National Prohibition no longer speaks "with 'bated breath and whispering humbleness." Drunkenness is not looked upon in the present day as a self-regarding act, and no stretch of imagination or stiff-necked individualism can make it so. We punish a man for attempting to commit suicide; has a man then no right over his own life, over the disposition of his own body, cry the fanatics of individualism? Supposing it were proved that the suicide has not a friend or relation in the world, that he is responsible to himself alone for his actions; yet society or the State, whichever you like to call it, has decreed that a man has no right over his own life, and that he is responsible to the State and punishable by the State if he attempts to take it. And this is quite right. For it has been proved, and almost stands to reason, that where there exists an indifference to human life, and where men can easily put an end to themselves, or can attempt to do so without punishment, there also exists a total disregard of the sacredness of human life, and murder is much more frequent, and not looked upon with such horror. Suicide then is not a self-regarding act, because it lowers the tone of social morals, and the State has a right to keep its standard as high as it can. I think there are very few, even those who are strong individualists, who protest against the punishment (which is generally very slight) meted out to suicides.

But it is astonishing to note the adaptability of human nature. It is slow to adopt changes, but quick to adapt them when once they have been effected. Who now troubles himself whether the Voluntary Education Act, the Postal and Telegraph system, the Factory Acts, and many other measures for the good of the people, savour of Socialism or not? The large majority of the people are only too glad to benefit by the general improvement which has resulted from these State-created institutions, and certainly there has been no national outcry against the restriction of individual liberty which they have involved. A few crotchety-minded, self-loving individuals are still to be found croaking over these changes, and deploring them; but fortunately the swift course of time is passing them by on one side, and their reproduction will be difficult. But the very people who are now passively submitting to, and even passionately admiring as national institutions, the law-created improvements we are enjoying to-day, draw the line at any interference with one of the most crying evils of the country—the drink traffic. The appeal to experience strikes on a deaf ear. The splendid results of past legislation in other matters, scarcely less important, do not convince their minds on this subject, they see no parallel between them. The English are not a logical people. This fact, I think, has been admitted by all our great thinkers. It is the want of the power of drawing conclusions from ascertained and proved data that stands in the way of more rapid national development. The man who now admits the supreme advantages of compulsory education does not admit and cannot see that legislation with regard to alcohol as a beverage would be a benefit to the nation.

His prejudices are still so obstinate and deep-rooted that his mind is incapable of grasping the effect of a given course of action. This is the result of ignorance. "There is no darkness but ignorance," says our great poet Shakespeare, and truly it is so, for if the adult men and women of this country were universally enlightened upon the effects of the substance called alcohol upon the human system, upon heredity, upon the wealth of this nation and its general prosperity, they would not rest a day until the accursed thing was relegated to the limbo of the past. But by the time this universal enlightenment could be effected, England would be gone to her doom, and from this fate the reformers and philanthropists of to-day wish to save her.

Law as often educates public opinion as *vice versâ*, although Buckle, the learned and gifted author of the "History of Civilization," holds the latter view. He says, "To seek to change opinions by laws is worse than futile. It not only fails, but it causes a reaction, which leaves the opinion stronger than ever. First alter the opinion, and then you may alter the law." But I would make this observation, that by the time the opinion has been universally altered, there would be no necessity whatever to change the law. And meanwhile chaos would reign. But in another place the same great writer remarks, "There is but one protection against the tyranny of any class, and that is, to give that class very little power." Now the tyranny of the brewing and distilling class in our nation is unrivalled and is appalling. Its vested interests are everywhere, held by the Church and the State, by public companies and private individuals. The brewery almost rules England, politi-

cally and socially, and it is a tyranny of the worst description, because of its baneful influence. Therefore we must give that class very little power. I think this is a clear logical deduction from the above remark. But there are many, of course, who will dispute the truth of the statement, that drink is at the root of so much preventible evil in England. Rather than open up the doors to legislation, they would stoutly deny the figures and statements of thinkers, politicians, philanthropists, and men of science, who have devoted many years of their lives to the consideration of this mighty question. And such people would also argue that it would be but a transference of power from one class to another, from the brewing class to the teetotal class, and as open to tyranny by the latter as by the former. Of course, there are none so blind as those who will not see, and the brain must be stultified indeed which can go through the world without being appalled by the incalculable amount of misery, vice, disease, and crime produced by drink. Statistics and statements are all to no purpose for these people. And as to the tyranny of the teetotal class, if successful in legislating on this subject, it is quite certain that the term would be misapplied, for there can be no possible tyranny in legislation which is effected for the common welfare, and which has received the vote of the majority who are representative of the people. No law is passed in England without a majority in its favour; and whether the measure be a bad one or a good one, it must have this majority first before it becomes law. But it is quite certain also that many laws are passed by a majority in the House of Commons which have been very little heard of by the great mass

of voters. These are not always the worse laws by any means, though it is certainly desirable to bring an important subject well to the front, to ascertain the sympathies of the people before it is legislated upon. Many such subjects have sacrificed ministry after ministry and thrown the country into a turmoil for years with elections and re-elections, until the nation has made up its mind what it really wants, and what it is determined to have. Agitation is political education in England, and I, for one, would never tolerate the voice of the people being stifled. Let us have and uphold freedom of thought and freedom of speech by all means, these are the vitality of the nation, the very source of its greatness and power; but laws we must have for the maintenance of peace and order, for the repression of vice, the punishment of crime, and the protection of persons and property. But we cannot guarantee the nation's greater protection and safety in any of these particulars, until the drink question has been legislated upon. So long as Alcohol is permitted to run an unchecked course amongst us, so long will the nation be beset with crime and vice of every description, with preventible diseases and increased pauperism. "The sight of means to do ill deeds, makes ill deeds done," says a prominent character in one of Shakespeare's plays; and everybody will admit that these words apply with telling effect to an article in such common use as Alcohol. It is also quite certain that amongst these nations and races where this article is not known, the people do not suffer from the same diseases, and from the same vices, crimes, and kind of poverty which are common amongst us, and which are traceable directly to the influence of Alcohol.

We can all see the beam in the eye of other nations, but not the mote in our own eye. No country has been more enthusiastic in its utterances and more universally aroused in its feelings than England in the matter of the opium traffic in Hindostan and China. We hear with horror of the frightful devastation and misery wrought by this poison amongst the inhabitants of these countries, and legislation on the subject in the land tributary to us is not deemed an infringement of the personal rights of the people. Things which are near to us escape our notice; as our sight is incapable of taking in their immensity all at once, we see only a very small part of the whole. The enormous and almost irreparable evils produced by intemperance in this country equal, if not exceed, those produced by opium in China and India. The physical, mental, and moral effects are almost exactly similar. There is the same moral degradation, mental ineptitude, physical deterioration produced in both instances, the only difference being that, in one case the drug is taking its pernicious course on a higher physical and mental organism, drink having been more or less common in all classes of society. In the opium-eating countries the habit is confined to the very lowest and most degraded of the population, the higher and better educated being deterred from its use by their religion and customs. It is the earnest desire of temperance reformers in this country, whether they take their stand on the medical, social, political, or religious aspect of the question, to bring the people of England to see this mote in their own eye, and to urge them to do the utmost to get rid of it. What right have we to preach against the vices and to deplore the habits of other nations, when

we have such a giant of evil stalking in our own midst? Would it not be better to whitewash ourselves before we attempt the whitewashing of our neighbours? No intelligent and truth-seeking foreigner has ever visited this country without having remarked upon the prevalence of drunkenness amongst us. Our fame, or rather infamy, in this respect, has spread far and wide, and we have been dubbed the most drunken country in the world—a statement which is not altogether quite true. An unenviable notoriety, certainly; and yet knowing our faults, we have not put them to mending. Even the superhuman efforts of temperance reformers during the last thirty years have only been able to reduce the national drink bill of the country from £3 10*s.* 8*d.* per head of the population in 1857 to £3 6*s.* 9*d.* per head in 1886, a decrease amounting to only 1*s.* 11*d.* per head. I attribute this failure to the shirking attitude and antagonistic feeling of successive Governments on a question of vital importance, and no improvement will be possible until *vested interests* in Alcohol are treated with the contempt they merit. Good must be accomplished for good's sake, and not left undone because there are a number of influential and wealthy people who would suffer a diminution in their income, if the cherished source of such income were overthrown. Let such people find a more respectable way of employing their capital and gaining their living, than through the miseries, sorrows, and degradation of their fellow-creatures. Let Governments find a worthier means of revenue than that which is extracted from the ruin, bloodshed, tears, and despair of a suffering humanity. A State cannot flourish and prosper, as it should do, under such conditions,

for a population which spends on an average about £125,000,000 yearly in drink must become handicapped in the race of life, and must ultimately collapse.

As all European nations and the United States, I am sorry to say, drink Alcohol to the same extent as we do (some nations even more so than ourselves), England may still maintain her supremacy amongst the countries of the earth, if she abandon her pernicious habits. Indeed, one can see no limitation to her future prosperity and glory if she shelters a sober race ; but if she allows her rivals, or her friends amongst other nations, to outstrip her in this respect, she will sink as inevitably as the vessel storm-tossed on the rock-bound coast, for ever lost. She will descend to the level of a third-rate power, and the proud-hearted Englishman will become an "unconsidered trifle" on the face of the earth. History may repeat itself under the same conditions; but if we alter the conditions, we may frustrate the repetition. A nation's downfall has nearly always been preceded by a period of licentiousness in drink, manners and morals. We must indeed be deaf to the warnings that history presents, if we ignore the causes that brought Greece, the scholar's paradise, the abode of the beautiful and the true, Rome, the nation of warriors and learned men, Egypt, Babylon, Assyria, and many other ancient nations, to absolute and irretrievable ruin. Drinking to excess grew up amongst all these different races where asceticism with regard to physical pleasures had prevailed. But it was due to their asceticism, to their plain living, and rigorous modes of life that these nations became what they were ; and it was only when they began to indulge in all kinds of loose living, which drink makes possible and incites to,

that the physique became degenerated, the mental power destroyed, the moral power undermined, and the nation overthrown. We have seen the origin and rise of England, and we know that she is just now at that perilous point when she may either continue to progress or commence to retrograde. There is an enormous wealth in England at the present time in conjunction with the most abject and deplorable poverty. Starvation stalks by the side of wanton luxury, misery by the side of pleasure. The very wealth of England may be the means of her ruin. Those who have it indulge in riotous living from idleness, ennui, and want of something to live for; those who have not got it will brood over their miseries, and will drown their troubles in the narcotic draught. Wealth breeds vice and discontent, misery breeds vice and discontent, and both seek the same means of relief from the weariness of life. The rich man or woman drinks, when they do not belong to the exceptional few who make work for themselves, for almost the same reason as their poverty-stricken neighbours. In neither life is there any ideal to work for, any end to be arrived at, any lofty ambition or unselfish motive to guide the actions of either class. Each is governed by gross materialism—the one from want, the other from excess. The rich are almost as much to be pitied as the poor, excepting that the vice and discontent of the former are self-incurred and therefore preventible.

If England recognises her perilous position in time, and if her robust middle classes, at present her bulwark and safety, the healthy balance between the two extremes, are determined to save her from destruction, these conditions must be seen to and must be righted. Excessive

wealth, the parent of drunkenness and licentiousness, must not be allowed to flaunt its gaudy head in the face of excessive poverty, which breeds the same vices. No nation can flourish where such extremes exist, because they are the source of its weakness. I do not say that the middle classes are free from vice, and from the vice of drunkenness, but their conditions are less fertile for the growth of these evils. Where people have to work hard, to live rigorously, to think of the future, there is not much time to devote to purely selfish pleasures and low vices. It is a pity that the science of statistics has not yet been developed to its utmost, as then we should be able to ascertain with accuracy which classes spend the most in drink. I think it would be found that the great bulk of the £125,000,000 yearly expended on drink would be divided between the very wealthiest and the very poorest of the population. It may be argued that if the poor are so very badly off, how is it that they can find enough to spend upon drink? The truth is, that owing to their empty stomachs and miserable homes, if homes many of them can be called, the little these people do earn by work, if they can get it, or begging if they cannot, goes into the till of the public-house. The pangs of hunger are assuaged by the narcotic influence of Alcohol over the nerves of the stomach, and warmth, brightness, and companionship are enjoyed at the same time. Is there any comparison to be drawn between the dingy cellar or garret, with the dying wife and starving, weeping children, and the dazzling gin-palace, rearing its mighty head at every corner, where there is a welcome for every one, provided he has a few pence to spend on drink? Can one be astonished that feelings become

blunted, the heart dumb, the brain stultified? We ought to be astonished only that things are not worse than they are, that the social revolution has not yet taken place. It has been computed that £144,000 are spent every Saturday and Sunday evening alone in the public-houses of London. When the Mansion House Fund was organized for the relief of the poor and unemployed in London in the year 1886, only £70,000 could be raised, the same amount as that spent during one evening's purchase of drink. I leave these figures to point their own moral in the minds of all thoughtful people. Truly our great poet said, "Oh, thou invisible spirit of wine, if thou hast no name to be known by, let us call thee devil."

In waging war, then, against the drink traffic of this country, we are attacking and attempting to destroy drunkenness, poverty, ignorance, and vice in all classes. We are attempting to awaken in the rich a recognition of their duties and responsibilities towards the poor; in the poor we are endeavouring to inculcate feelings of prudence and self-respect. With the advantages which the wealthy possess, they should be as shining lights to their poorer brethren, who only by an accident are born in a different position. Every day sees the social revolution working to those who study beneath the surface of things. We must hope and desire that it may pursue a bloodless course, and that brotherly love will take the place of violence. There is no violence without reaction, and in this great question reaction would retard progress a century. Changes must be effected without hatred, enmity, and bloodshed, and we must look for the assistance of the State in dealing with the wrongs of the poor. Meanwhile, one of the greatest causes of pauperism,

crime, and disease, should be removed by the State, so as to give all classes a fairer chance of a healthier and happier existence. I am not one of those short-sighted people who maintaiu that drink is the supreme cause, if not the sole cause, of poverty and pauperism. In a complicated legislation such as obtains in this or any other civilized country there exist many causes for these conditions, and we must, indeed, know very little of the organization of our society, of the ever changing laws of political economy, to make such an erroneous statement. Drink has brought many thousauds of individuals and families into the lowest depths of poverty, into a pauper's grave. The majority of our workhouses, pauper lunatic asylums, aud gaols are filled with the victims of drink, and yet it would not be true to say that it was the *sole* cause of poverty. It is one of the greatest of the many causes producing this condition in our midst, and one of the most deplorable because preventible, but it is not the only cause. Drink aggravates poverty, and in a great many instances which every one can call to mind has been the direct and only cause of it; but there are many hundreds of thousands of poor people, living on a miserable pittance, daily struggling to keep their heads above water, whose stomachs are never well filled, whose bodies are never warmly clad, who when they are ill have to seek the workhouse infirmary, whose lives, iu fact, are one long groan of anguish, who yet have kept away from drink, and have been strong against its alluring qualities. Still they are poor, poverty-stricken, next door to paupers. We have thousands, it would be more correct to say millions, of such people—men and women, youths, young girls, and little children—in our midst, who live their lives

without a gleam of joy or hope, a prospect of health or happiness in them. They are the struggling, respectable poor, whose pinched features, worn and anxious looks, emaciated frames and pallid countenances betray the hour-to-hour struggle with grim want.[1] Such faces are enough to shame us in our slothful ease, surrounded by our luxurious comforts; they are the skeleton of the feast, the cancer in our breast. These millions are not the victims of drink—drink has not directly brought them to this state of poverty. The heroine of Hood's Song of the Shirt was not a drunkard; her struggle with existence was not brought about by drink; it was the result of certain social and economic conditions which philanthropists, social reformers, and the people themselves now recognise and are determined to modify. The victims of the abominable sweating system in the East End of London may consume a great part of their miserable wages in drink; but if they were total abstainers, every one of them, their earnings would not be any higher. It is quite probable that the employers would even benefit by their victims becoming, in mass, total abstainers; for as they look upon Alcohol as a necessary of life, they would grind the wages down lower, if their work-people were to do without it. No, the poverty I am now describing is due to competition in the labour market, the capitalist system, over-population, the decay of agriculture and many other causes, but not to drink. Such poverty very often excites the habit of drinking, by which it is greatly aggravated, but it is not caused by drink.

The degraded poverty which exists amongst Eastern

[1] *Vide* Walter Besant's "Children of Gibeon."

races, and which is seen in Italy, Spain, and Egypt, is not due to the drinking habits of these nations. It may, in some few individual cases, have been brought about in this fashion; but certainly drink is not the *cause* of poverty amongst them. There are other causes at work which have to be reckoned with. Neither are they the same in all countries, owing to the different conditions which govern each nation. It would be beyond the scope of this essay to enter into all the fundamental reasons for the existence of poverty in the different nations of the earth; suffice it to say that drink in our own country is a great and determining cause, a sufficiently serious cause, and one which is preventible beyond all dispute. When we have suppressed the drink traffic, which will result in a marked diminution of misery, vice, crime, disease, and pauperism, we shall still have the poor amongst us, and we shall still find that there is plenty of work to be done in freeing them from bondage, and raising them to a life of hope, happiness, and content. Fortunately many are at work in different directions trying to bring about a better state of things; but the temperance reformers must be the most ardent, enthusiastic, and persistent workers in their particular line, as they have about the hardest battle to fight, and the longest struggle to look forward to. Nothing can, in my opinion, equal the wonderful results which the suppression of the drink traffic will bring about. With brains unclouded by Alcohol, with healthier minds and bodies, the political and social problems which now trouble our society will be solved with greater accuracy of judgment, with greater precision and justice than are possible at present.

We have been too long the slaves of a pernicious custom, a custom which has attacked the vitality of the nation to an alarming extent, as will be seen in subsequent chapters. Alcohol has been acting in the human system like a corroding fluid on any substance, insidiously working its way at and gradually destroying the healthy human structure. Take, for instance, the case of our legislators assembled together in solemn conclave to discuss the affairs of the nation. How many of them come together with healthy brains and therefore unclouded judgment, with calm clear minds and therefore unprejudiced views? In the after-dinner hours, I should say very few. The heated argument, the passionate personal debate, the scurrilous word-throwing, the jeers, insults, and contemptible threats are not always the result of a righteous indignation in a holy cause, they are too often the result of brains inflamed by Alcohol. I think it is even strictly true to say that the total abstainers and very moderate drinkers in the House of Commons are those who are the most assiduous in their attendance, the best all-round workers, the most courteous opponents, and men whose judgments are the most reliable.

It is impossible to judge accurately of a question when the imagination is inflamed by an ardent liquor; there must be confusion of thought and consequent worthless decision. Very often men whose sympathies are aroused and hearts are touched in a righteous cause, who think they are prevented by the party to which they belong from showing their true opinions, have blunted their feelings and silenced their higher thoughts by means of Alcohol. This insidious poison soon distorts the views of the clearest thinker, and renders him pliable in the

hands of those who want to make use of him. He allows others to do his thinking, and even learns to forget that, in a lucid moment, he held a different opinion. I never quite allow myself to trust the views or judgment of a man or woman who drinks (and I am now only referring to those who call themselves moderate drinkers), because I never feel sure of the mental clearness which has brought about the opinion. A total abstainer may hold a wrong and prejudiced view of certain questions, but in this case it is more a flaw in the character than the result of a brain muddled by a mischievous agent like Alcohol. It is scarcely to be wondered at that members of Parliament, ignorant as the great majority of them are of the effects of Alcohol upon the human system, should indulge in that drug to the extent they do. The strain upon the constitution by long and oft-time fruitless debates, by excessive application to business and prolonged sessions, is not unfrequently fatal, and Alcohol is, in a large number of instances, looked upon as the only supporter of the frame under such unhealthy and unnatural conditions. It is sought both as a stimulant and as a narcotic; it is often made to take the place of food. The life is often so strained and artificial that one is not astonished at the seemingly little progress which is made in questions of the greatest public importance, and it certainly is not to be wondered at that legislation on the drink question itself should meet with scant courtesy and ill-concealed impatience. Why should these men be expected to legislate against the use of the very article which, in their opinion, is a vital necessity? It is almost unreasonable in total abstainers to expect it. But here again is

the darkness of ignorance; for if there were a more general enlightenment upon this subject, legislation would be found to be in the best interests of the community, and members of Parliament themselves would be the first to recognise this fact. It has so often been stated that people cannot be rendered sober or virtuous by acts of Parliament, that any reference to legislation on the drink question is received with impatience and disgust by the large majority. It has become one of those stock phrases which catch the public ear, but which mean absolutely nothing when examined by the calm light of reason. According to this dictum, no act of Parliament has ever yet resulted in any general good to the community, and everything would have gone just as well, if not better, if the people had been left to their own lawless passions and unguided actions. But every reasonable person must know and acknowledge, if he has studied anything whatever of human nature and of history, that our present state of civilization, faulty as it is, could never have been reached if it had not been for the continuous check which law has exercised over society. I venture to say that acts of Parliament, emanating from the people and crystallized by their representatives, have partly educated the people in understanding their responsibilities and duties towards one another. They have done nearly everything in restricting crime, suppressing vice, and compelling the maintenance of order, in an ignorant and uneducated society. If acts of Parliament cannot render people sober, they can prevent them from being drunken to the extent of harming and endangering the lives of others. Society would indeed be a chaos if it were not for the existence

of laws; it is a question only of what laws are permissible and what are not. I contend that all actions that affect injuriously a human being, whether it be himself or another, come within the strict province of the law, and society would be benefited by placing a restriction upon such actions. If laws are not made for the benefit of the community, they are, I acknowledge, of very little utility; but experience generally teaches us which laws are beneficial and which are not. It is quite certain that if people cannot easily obtain Alcohol, they will be prevented from drinking, and will become sober; therefore an act of Parliament will make them sober. It may be against their desire to be rendered sober in spite of themselves; but custom will soon become second nature, and our posterity will look back to the drinking era of their country as one of the most foolish and perilous in the whole of their national history. The wonder then will be that human beings allowed such a destructive and criminal agent to remain so long in their midst without care or heed, and that there existed so much selfish indifference and crass prejudice upon a subject of vital and national importance. The frightful and fatal drinking customs of this and other countries will always be a subject of historical interest to an enlightened posterity. They will also carry a very significant and pregnant lesson to the honest inquirer; and when other evils crop up in a future society, perhaps they may be more readily and effectually dealt with, and not allowed such a long and lawless reign.

It would be beyond the scope and purposes of this unpretending essay to enter into a discussion as to the most suitable kind of legislation which ought to be

followed with regard to the drink question. The great thing is to prove that legislation is necessary, and the best method will soon be found after that fact is established. There is no doubt that the State has a solemn duty to perform in this matter, and the time is quickly coming when a large section of the English public will rebel against the indifference and slothfulness which meet even the smallest attempts of legislation on this subject. There has been piecemeal legislation of all kinds from time to time, but none of it has been effectual. Only in those places where it has been thorough and drastic has it served any good purpose. It would be as well to consider here the effects of liquor legislation in other quarters of the globe. In some parts of the United States liquor laws have been introduced with the most beneficial results. The Maine liquor laws are an example of this in the State of Maine itself. These laws, which totally prohibit the sale and manufacture of alcoholic liquors as beverages, have been in existence since the year 1851, when they were passed by a large majority of the inhabitants. Again in 1884 the people ratified their previous decision, on the occasion of a Presidential Election, by passing an amendment to the State Constitution, which was carried by a majority of 47,000. This amendment was to prohibit *for ever* the sale and manufacture of intoxicating liquors. The people of Maine had had a long trial of the laws, and certainly proved, by their adoption of the amendment, that the State had benefited by their existence. Many of the other States and towns in the United States have not been so fortunate in the result of their liquor laws. Although the drink evil has really been more energeti-

cally recognised and dealt with in America than elsewhere, although there now exists a large national party in favour of Total Prohibition which is sufficient to influence a Presidential Election, yet the laws in a great many places are either a dead letter, secretly evaded, or openly put at defiance. This is the testimony of numerous travellers in the States, and of earnest writers upon the subject. The consumption of alcoholic liquors is enormous and increasing in America, and drinking habits prevail there as elsewhere, with all their attendant results. Drink is acknowledged to be by the ablest writers, thinkers, and reformers of that country, one of the most salient evils they have to fight; but the people have not yet been able to determine the best means of grappling with the evil legally.

In some parts of Canada the Scott law obtains and is rigidly enforced. (This is a kind of Local Option law, by which a majority in any county can entirely prohibit the sale of intoxicating liquors.) In one town, Kingston, in the county of Frontinac, the law is not in existence; and the consequence is, that those men and women residing near this place, but living under the Scott law, who want to indulge in a bout of drinking, repair to Kingston for that purpose. Consequently, Kingston is a hell upon earth, and is the refuge of all the hard drinkers and drunkards living near it. It has been sought to be proved that, because Kingston encourages and harbours those who cannot resist the temptation of alcoholic drinks, that therefore the Scott law is useless, arbitrary, and dangerous to individual freedom. It must prove in the minds of all unprejudiced seekers of the truth that, given an outlet to human weaknesses, certain

men and women will indulge their weaknesses whenever there is an opportunity for doing so. Gambling is a vice prohibited by law in this and other countries, but that does not prevent a large number of those who can afford the expense from travelling to those places where it can be indulged in without penalty. At the same time, it is quite certain that gambling, from having been an almost national failing, has become restricted to comparatively few since the severe penalties of the law have been attached to it. The national feeling or public feeling has been gradually educated to abhor the vice of gambling, and there would be a general outcry if the law which prohibits it were to be rescinded. So public opinion can be influenced and modified in the same way by laws directed against the liquor traffic, as is seen in the State of Maine and other parts of the United States and Canada, where prohibition exists.

But America, though grappling with the drink evil in places or counties here and there, is found to spend an enormously high figure annually on its drink bill. With a population not doubling that of the British Isles, the United States in the year 1886 expended 1,000,000,000 dollars (£200,000,000) upon alcoholic liquors. Little wonder that the more enlightened and far-seeing of the Americans should be exercising their brains and doing their utmost to suppress such a traffic, which can only impoverish that otherwise rich and prosperous country. But legislation there cannot be unanimous, as each State governs itself on local matters, and up to the present the drink question has been treated locally rather than nationally. The consequence is, that next door to a State where prohibition is rigidly enforced, another State

may exist which has full and unbridled licence in the liquor traffic. Between one town where Alcohol cannot be obtained at any price, and another where bar-saloons and dram-shops reign supreme, there may be a distance of a few miles only, and those who want to drink will certainly find their way very quickly from the former to the latter. Moreover, there must undoubtedly be a great opening for smuggling and other contraband practices; for it is almost certain that alcoholic liquors can be conveyed from one country or place to another near it, without always being discovered by the officials. This would naturally give rise to a large amount of secret drinking, which is more deplorable in its moral results than a custom, however bad, being carried on openly. There is no doubt that on the other side of the broad Atlantic the fringe of this great social question has only been touched, and that it will require all the earnest conviction and untiring devotion of temperance reformers to attack and demolish a traffic which consumes in a useless and dangerous article the appalling sum of 1,000,000,000 dollars annually.

On the continent of Europe, several countries are beginning to wake up to the enormity of the drink question in their midst. Medical men and social philanthropists have put their finger on Alcohol as one of the main causes of disease and pauperism. An eminent physician of Paris, Dr. Lancereaux, stated that in the hospitals of that city, one of the commonest causes of death was disease due to alcoholic poisoning; and during the last ten years there has been an increase in France in the consumption of alcoholic liquors from 970,000 to 1,500,000 hectolitres. The quantity has nearly doubled,

although the population has remained stationary. Suicides from drink have multiplied sixfold during the ten years from 1874 to 1885. Insanity has increased from this cause from nine per cent. to sixteen per cent., and in certain departments has reached as high as twenty-eight per cent. Twenty per cent. of the accidental deaths are due to drunkenness, and the evil is becoming so excessive that stringent measures are proposed to deal with it. In a work called "L'Assommoir," by the French novelist M. Zola, the history of a drunkard is portrayed with detailed and horrible realism, but with the naked truth ringing in every sentence. A play called "Drink," which for many successive nights held the boards of one of our metropolitan theatres, was adapted from this novel into English, and taught a frightful lesson of the horrors of drink taking possession of a human being and bringing him step by step to a hideous end.

It has also been shown that adulteration of wines and other intoxicating beverages by stronger and more poisonous kinds of Alcohol is a very common matter, and that purity (so-called) cannot be ensured to the consumers under a very high and prohibitive price. Under the notes from Paris in the *Lancet*,[1] M. Bacchi read a paper on the importance of ensuring what he calls pure Alcohol for drinking purposes. He has found a substance called *Furfurol* in variable quantities in the different alcoholic beverages. It is met with in the Alcohols obtained from cereals, such as oats, rye, barley, etc. "It is a colourless liquid, becoming rapidly brown

[1] October 8th, 1887.

under the influence of the air, and possesses an odour recalling at the same time that of the oil of cinnamon and that of bitter almonds." When administered to an animal in its pure state and in minute doses, it produces all the phenomena of epileptic convulsions, and respiration is soon arrested. In the same article is given some very interesting statistics as to the increase of insanity in France, which will be quoted in another part of this work. France is becoming alive to the fact that her population can no longer be regarded as examples of sobriety, that she is losing ground steadily as her drinking habits increase. The French are a logical people, whatever their other faults may be; and when once they are convinced about the inutility or evil of a thing, they do not remain quiet until it has been completely changed. Public opinion once roused on this question in France, there will be no rest until every dram-shop is closed, even should it ruin every vine-grower to a man. But there is no fear of the ruin of these people, as the beautiful grape will be grown for a far more worthy purpose than that of conversion into wine, and as it becomes a cheaper fruit, it will be consumed, not only in its native form, but as the wholesome nourishing raisin. An extra food will be given to the people, cheap, delicious, and health-giving, and the destruction of one of the most beautiful fruits of the earth to produce wine will be looked upon as an act of barbarism.

There can be no manner of doubt, on the other hand, that wine freshly made from the grape and drunk on the spot has not the same powerfully intoxicating effect as that which is conveyed to other parts of the country, or exported. When sent away, the wines are "doctored"

by the liquor merchants and importers in order that they may keep better, and be rendered stronger than the original. The vine-growing countries are certainly not notorious for their drunkenness; indeed, they bear very favourable comparison with those which are remote from the grape and wine-making districts. Habits of drink may be far too prevalent, and the inhabitants of these parts may suffer more or less physically, mentally, and morally from them; but neither Spain, Italy, nor the South of France can be quoted as examples of the disastrous effects of drinking upon a people. In countries where Alcohol is manufactured from grains of different kinds, we find the worst forms of drunkenness and disease. In Russia, Switzerland, Belgium, Denmark, and Holland, where alcoholic liquors are prepared from the potato, maize, corn, etc., a frightful amount of drunkenness, with all its attendant horrors, exists. The physique of these people is deteriorated to an extraordinary extent, the stomach is soon injured for the purposes of healthy digestion, and nervous diseases and insanity are very prevalent. I maintain, and certainly the opinion is warranted by the present state of our knowledge on the whole subject, that Alcohol, even in its purest forms, is very injurious as a beverage to the system, but some Alcohols are far more dangerous and poisonous than others. In France, then, the whole question of drink is arousing the interest of the foremost men of science and social reformers, and the day is not far distant when a crusade will be waged there against this pitiless foe to peace, health, and prosperity.

In Germany the question has also aroused interest of late, and Prince Bismarck tried to deal with it by

endeavouring to pass his Spirit Monopoly Bill, by which the Government were empowered to monopolise the sale of all alcoholic liquors. He thought by passing this bill to restrict the sale and raise the price of intoxicating beverages, and in this manner to modify the drinking habits of the people. One may doubt the efficacy and expediency of dealing with the question in this manner; at any rate, in that country it proved very unpopular, and was the means of overthrowing a ministry. It is almost certain that if Governments are allowed this monopoly it may lead to as much abuse as exists under the present condition of individual freedom, for in times of trade depression and empty exchequers, when the revenue was deficient, restrictions would be removed and an incentive to drink provided. Therefore, as much danger is to be expected from a State monopoly in an article of this kind, as from that possessed by merchants, manufacturers, and traders. Temperance movements, on the vast scale which they have assumed in England, and which are becoming daily a part of our national programme, are unknown on the Continent. Some efforts have been made, here and there, as in Norway, Sweden, and Switzerland, to buckle to and do something towards creating an interest and enthusiasm in the subject; but there is amongst the other large and important nations a kind of mental apathy and deep-seated indifference which strikes us English people as almost immoral. I think it is due in a large measure to the want of public spirit in these countries, the inhabitants of which do not appear to take such a lively public interest in the questions of the hour as we do in England. We love lectures, meetings, debates, demonstrations, and all that life which

brings the people to publicly state their grievances, wishes, aims, and aspirations. Thus subjects are ventilated amongst us, and well discussed publicly and privately, fought about in newspapers, and thoroughly threshed out. The friction of contrary opinions ultimately ends in arriving at some definite conclusion which becomes a matter of legislation, and thus our laws are originated, emanating from the people themselves. This is not the Continental plan generally. The public voice is more or less silent, and societies and organizations for the full and free discussion of questions pertaining to the welfare of the nation, politically or socially, are either unknown or suppressed by police authority. And, moreover, there are few countries which, like ourselves and the United States, have recognised the disastrous consequences of drink and drunkenness. The question has not yet struck the minds of thinkers, politicians, men of science, and ministers of religion in these countries, but that it must do so sooner or later is only a question of time. In Belgium there is one public-house to every forty-four inhabitants or ten families. This is the consequence of the duty upon Alcohol being very low in that country; whereas it is two hundred francs per litre in France, and as high as six hundred in England, it is only fifty francs per litre in Belgium. In Antwerp the evil has assumed gigantic proportions; and in a part of the city facing one of the quays, every house is a wine and spirit shop. The sailors visiting Antwerp from all parts of the world are tempted into these low *estaminets*, and drink of the vile poisons sold, as long as they possess a cent to spend. There is no restriction upon the hours of closing, and only when the peace is disturbed by brawls,

assaults, or crimes, can the police interfere to do anything. The evil is being generally recognised in Belgium, and societies have been formed to discuss the remedy. A very interesting conference on the question was held in Antwerp in the year 1886, by which the work received much impetus. But it must become a question of national importance; public opinion must be appealed to and aroused before the law can be altered on the subject in Belgium. The awakening has only just begun there, but torpor and indifference can never again take possession of minds once opened to a question of such magnitude. Belgium spends more upon alcoholic liquors than almost any other European country; this is due to the lowness of the duty upon them, as seen above. The annual consumption in Belgium per capita is 9·20 litres [1] of spirits and 169 beer; in the British Isles it is 5·37 spirits and 14·30 beer; Russia, about 16 litres spirits and 4·5 beer; France, 7·29 spirits, 119 litres of wine, and 21·10 of beer; Germany, 8·60 spirits and 65 beer; Holland, 9·87 spirits and 27 beer. By these figures it can be seen that England is by no means the most drinking nation in Europe, and that its figures compare favourably with the other countries given. Denmark, with 18 litres of spirits per capita and 33 of beer, is the highest of all with respect to the strongest forms of alcoholic liquors, and Norway is the lowest, with a consumption of only 3·90 litres per head.

In the last-named country, the temperance movement is being carried on with the greatest diligence and success. So much so, indeed, that in ten years there has been a falling off in the consumption of alcoholic liquor

[1] A litre is 1 pint 15 oz.

from 6 litres per head to 3·90 litres. "We hear that 650 total abstinence societies have been formed, with a membership of 73,000, besides a number of Good Templar Lodges and Blue Ribbon Societies. An address to the Storthing demanding a law prohibiting the manufacture and importation of alcoholic liquors, obtained in a short time the signatures of 65,000 men and women over twenty-one years of age, although it was not by any means generally circulated. In the province of Christiansund, a similar address obtained 35,000 signatures. Twenty or thirty members of the Storthing are also members of total abstinence societies, though they were not elected as representatives of the idea. In short, we we may look with confidence for a prohibitionist party in Norwegian politics in the near future; and in India and Denmark there are indications that similar forces are at work."[1] The above work has been accomplished in a country which numbers but little more than half the population of London. In the province of Bergen, in which is situated the seaport of that name, a system has been adopted by the inhabitants themselves, which has produced very beneficial results. The whole of the drink traffic is in the hands of a local committee, who regulate the sale of intoxicating liquors. Spirits and wine cannot be obtained at any hotels, and the dram-shops where they are sold are few and far between. Not more than a wineglassful can be purchased at any time. The majority of the inhabitants drink the ale of the country, which is of very light quality, and contains only 1·5 per cent. of alcohol, scarcely more than our well-known ginger beer.

[1] The New York *Nation*.

The spirit and wine sellers are selected for the dram-shops at a fixed salary by the committee; and as they reap no advantage whatever by the sale of alcoholic liquors, they place no temptation whatever in the way of purchasers. The proceeds of the drink traffic in Bergen go towards improvements in the town, and there is one beautiful road leading from the town to the top of a neighbouring mountain (where a lovely view is obtained), which is called the Dram way, on account of its having been made from the money so obtained. It is acknowledged by all trustworthy writers on Norway, and by those who have travelled there, that drunkenness now is a very rare occurrence, that pauperism as we understand it—rags, filth, viciousness, degradation—is unknown. The above arrangement cannot be altogether a satisfactory one, but it is better than nothing; and until the State has begun to deal more thoroughly with the question, it is well that the citizens should do what they can for themselves. The energy and public-spiritedness of the Norwegians are highly praiseworthy, and could serve as a brilliant example to more lackadaisical and phlegmatic nations.

The country of Sweden has had about one of the worst drink records of any. It has with truth been called the most drunken nation in Europe. There are "no less than 150,000 manufactories of liquid hell-fire, as they have been well denominated, which distil annually thirty millions of gallons of spirits for the consumption of three millions of people."[1] This was equal to ten gallons of spirits per head of the population. A truly enormous

[1] Alison's "History of Europe," 7th edition.

amount. So excessive became the evil that temperance societies were formed to deal with the matter, and what is known as the Gothenburg licensing system was adopted in certain parts of Sweden, but especially in the town where it originated and from which it took its name. Some writers have attributed partial failure to this system, but there is no doubt that the inhabitants think otherwise, since no effort is made to abolish it. Crime and immorality were very common in all parts of Sweden, and are said to have been "equal to that of the most depraved cities in Great Britain."[1] In the town of Gothenburg itself, and in the surrounding districts, drunkenness has very much decreased, although there is still an excess of drinking by all classes. The Gothenburg system is very similar to that which obtains in Bergen. A committee of gentlemen hold the drink traffic in their own hands, regulate the number of the houses supplying Alcohol, and hand over the profits to the town and for the reduction of the taxes. Thus the trade does not flourish as in other countries, and publicans cannot wax rich on the misery and degradation of their fellow-creatures. The working of this system must be an education to the people; and in time, as civilization becomes more advanced, the drink traffic, regulated as it is at present, must become still more unpopular, until it is vetoed altogether by the State.

In Switzerland, of late years, a strong public feeling has been aroused with regard to the prevalence of drunkenness amongst the inhabitants. We read that in certain parts of Switzerland the abuse of strong drinks

[1] "The History of Drink." Samuelson, p. 195.

makes greater ravages upon the population than would be caused by an annual epidemic. Body and mind are destroyed under the enervating effects of Alcohol. At the present moment there are 2,900,000 inhabitants in Switzerland. The annual consumption of alcoholic liquors among the 2,900,000 persons is as follows:—Two hundred million litres of wine (of which 97,000,000 are imported annually); two hundred million litres of cider; one hundred million litres of beer; twenty-seven million litres of spirits (of which 20,000,000 are imported annually under the form of spirits of wine).[1] Dr. T. T. Kummer, Director of the Federal Office of Statistics, at Berne, says, in a pamphlet published by him at Berne: "The above figures do not represent the whole list of drinks or liquors, the abuse of which may prove fatal, for in this statement no account is given of absinthe, Kirschwasser, brandy made from gentian, or cognac." And in another place he adds: "The canton of Berne contains whole villages where potato brandy is in such general use that some mothers give it in lieu of milk to their nurslings." The *Lancet*, commenting upon the above statements, which appeared in an influential daily newspaper, makes the following significant remarks: "It is devoutly to be hoped that this free country (Switzerland), which is one of the most drunken countries in Europe, will *agree to some abatement of its freedom* for the sake of a greater abatement of its drunkenness, which is telling so discreditably on its reputation. It is not enough in Switzerland that a law affecting its constitution should be carried by the chamber, it must also be approved by the popu-

[1] *The Times*, October 23rd, 1885.

lar vote. We are glad to say that this vote has been given." The *Lancet* goes on to add: "In our country we are still more famous for drinking than for legislation to abate drunkenness. Accordingly, in spite of a great increase in temperance in certain sections of society, much worse and deadly drunkenness obtains in others."[1]

The Swiss have lately passed a "monopoly law," by which the Government has absolute control over the sale of all alcoholic liquors, whether of home or foreign manufacture. The Government thinks that by this means it will be able to insure the purity of the Alcohol consumed, and so to diminish excessive drinking by the people. Whether this will be the case or not, remains to be seen. It is too early to judge of the effect of this policy, because no returns have yet been made; but venturing to prophesy on the matter, I think it is doomed to failure. Ardent liquors are still easily obtainable by the people, although the Alcohol contained in them is supposed to be of superior quality. Even an increase in the price, unless it is made very high indeed, will not prevent them from being purchased by those who thirst for them. A price must be very prohibitive indeed to prevent a man or woman with a passion for drink from indulging it. It would scarcely be to the interests of a Government, which reaps its largest revenue from this source, to make the price a prohibitive one. Surely a Government which was so considerate for the mental, moral, and physical welfare of its people never was seen! It would be difficult to point to such an one in the annals of history. But the Swiss are bound to see their way out of the diffi-

[1] *Lancet*, October 31st, 1885.

culty, having once put their shoulders to the wheel; and I do not think they will rest content until complete prohibition exists. If it has been the habit, as stated by Dr. Kummer, for mothers to give potato brandy to their nurslings instead of milk, little wonder that the inhabitants of certain parts of that beautiful country are stunted in growth, deformed in body, feeble in mind (*cretins*), and miserable specimens of human beings altogether. Surely such a deplorable habit as this would result in a high mortality amongst infants, and it would be interesting to obtain the statistics relating to this matter. Those who survive such barbarous treatment have their constitutions irremediably injured, and we can no longer be surprised at the unhealthy appearance presented by a large number of the Swiss. Any one who has travelled through that superb country must have observed, with something like astonishment, that the inhabitants are not in harmony with the nature which surrounds them. It would probably be rash to say that the unhealthy physique of the people is due entirely to their alcoholic habits; but knowing that drink exists to the extent it does there, and that alcoholic liquors are often taken in place of food, and upon an empty stomach, it is reasonable to suppose that the physique more or less suffers from such a treatment, and that strong and healthy constitutions cannot be inherited.

I have travelled a great deal in Switzerland, and have had my preconceived notions as to the physical beauty and strength of the people rudely shaken. I know of no country which has so disappointed me with regard to its inhabitants as Switzerland. The people, and I particularly mean the middle and poorer classes (because a

traveller has not many opportunities of judging of the richer classes, unless living in a country for some length of time), are not well made or finely built. They are rather below than above the medium height, are generally thin and very sallow. I have never seen one really handsome Swiss man or woman, as I have seen them by dozens amongst the poorer classes of my own country people or in other parts of the Continent. In many parts of Switzerland the life is a hard one, and the climate very trying for the greater part of the year; but these facts can scarcely account for the very degenerated physiques one observes. Goitre, cretinism, insanity, and deformities of the body are very common in Switzerland, and, in some villages I have passed through, more than half the inhabitants seem to suffer from one or other of these diseases. The vitality altogether seems low, and the faces of the people do not exhibit the full contour, rosy colouring, and brightness of look which accompany healthy organized individuals who inherit fine constitutions. The hospitality, amiable dispositions, and naturally good breeding of the Swiss are well known; it is a pity the standard of physical health cannot be raised in a country which can restore life, health, and strength to those who seek its pure and invigorating mountain air for that purpose. Switzerland seems made for the benefit of foreigners and not for its own people; it remains to be seen what temperance will effect for them.

Liquor legislation is being attempted in the Isle of Man, where a new Licensing Bill has been introduced by Mr. Laughton, a member of the Man House of Keys, containing many sweeping modifications of the present state of affairs. "It proposes to license boarding-houses

during the summer to sell beer and porter. Publicans are made liable for all fines incurred by persons on their premises, and no further grocers' licenses are to be issued. The cost of licenses is increased enormously, on a sliding scale, according to valuation, the lowest thing being £6 for a country house of the annual value of £40, and £8 10*s.* for a town house." It is to be hoped that this bill will become law, and will be the forerunner of more stringent measures dealing with the drink traffic in a thoroughly effectual and drastic manner.

Quite recently we hear from Spain that Queen Christina has signed a decree regulating the manufacture and importation of Alcohols into her country, and prohibiting the manufacture and sale of impure Alcohols intended for drinking purposes. Foreign Alcohols will be examined on arrival, and those which are impure will be so dealt with that they will be rendered totally unfit for drinking.

The attempt at legislation in different countries, as shown in the foregoing paragraphs, clearly proves that a widespread feeling, not confined to England or America, is being aroused almost everywhere with regard to the drink question. There are still some countries not yet awakened to a consideration of the enemy which reigns in their midst, and amongst these one which I have quoted as having an enormous consumption of Alcohol per capita. I cannot ascertain that Russia, that powerful and steadily progressing country, has initiated any legislative reforms with regard to the drink question and the Russian nation is being corrupted, morally, mentally, and physically, by its passion for intoxicating liquors. The gloomy but wonderful works which are produced by such authors as

Dostoieffsky, Count Tolstoi, and Tourguienieff present one with pictures of the drinking habits of the nation which are appalling. This is the more striking as these writers have no intention of pointing a moral or adorning a tale with a diatribe against drink. Their works are a series of faithful and realistic pictures of the habits, customs, and ways of thinking of the great Russian people, of which we Westerns know really nothing. Tea, Vodka, and Kvàss are the everlasting and constant drinks of the people, both in town and country; drunkards are as common as blackberries, and the infant mortality in some parts of Russia is something enormous. The standard of general health is not high, and the average length of life falls far short of that of the English. I do not remember reading in one of these original and powerful works of one really healthy individual. Suicides are more frequent in that country than in any other part of Europe, and disease and crime are wofully common. It is difficult to obtain trustworthy statistics about Russia; but the facts mentioned above can be read in the works of their most celebrated authors, and substantiated by travellers who have visited the country. Medical science in Russia does not yet seem to have attacked the question of Alcohol, although it has done much and produced many eminent names in other departments. And yet disease due to drink must commit wholesale ravages upon the population; for if, as we are told by medical authorities, more than half the disease of our own comparatively temperate nation is due directly and indirectly to alcoholic poisoning in some form or another, surely in Russia it must be nearly wholly and solely due to this agent.

Legislation in our own country up to the present time has been ineffectual and partial. It is true we have a licensing system which is supposed to restrict the number of houses selling spirituous liquors, yet there are no less than 180,000 persons holding a liquor license. In a population of something like thirty-six millions for the United Kingdom, there is one public-house to every 200 inhabitants. This is better than the state of things in Belgium, where, as we have seen, there is one dram-shop to every forty-four inhabitants; but still it is by no means a commendable factor in our much-boasted civilization. The very fact, however, that a licensing system exists at all shows that the legislature must have had their eyes opened to the harm produced by Alcohol. It is quite certain that no licensing system exists with regard to the sale of meat, bread, vegetables, etc., the necessities of life; and if, as has always been advocated by the ardent supporters of drink, Alcohol is also one of the necessaries, is a wholesome and harmless article of diet, why has it been considered essential to restrict its sale? We read that, in the eighteenth century, debauchery, vice, and crime of the very worst description were almost universal, owing to the drunken habits of the community at large. So gross and degraded became the drinking habits of the people that an Act called the Gin Act was passed in the year 1736. It was of a very severe nature, and during the first year of its existence there was a reduction in the consumption of spirit of about 200,000 gallons. Seven years later it was repealed, because after the first year it became almost a dead letter. As there were no police in those days to see that the laws were carried into effect, those which were distasteful and

abhorrent to the people were openly evaded and put at defiance. Thus it was with the Gin Act. The remedy was almost worse than the evil, and smuggling and contraband practices of all kinds were carried on almost openly. Things grew better when the Gin Act was repealed, and the duty upon alcoholic liquor was raised from one penny to one shilling per gallon. When the duty was raised to two and sixpence per gallon, the reduction in the consumption of alcoholic liquors was still more marked. It shows that to effectually carry out a stringent measure like the Gin Act, there must exist the needful authorities to see that it is not infringed.

With regard to the drinking habits of the English people of the eighteenth century, it is very interesting to read a paragraph from the autobiography of one of the greatest men of that time, Benjamin Franklin. He landed in London in the year 1726, ten years before the Gin Act was introduced, and at the time when, no doubt, the drinking habits of the people were becoming excessive. He says : "At my first admission into the printing house, I took to working at the press, imagining I felt a want of the bodily exercise I had been used to in America, where press work is mixed with the composing. I drank only water; the other workmen, near fifty in number, were great drinkers of beer. On occasion I carried up and down stairs a large forme of types in each hand, when others carried but one in both hands. They wondered to see, from this and several instances, that the *Water-American*, as they called me, was stronger than themselves who drank strong beer! We had an alehouse boy, who attended always in the house to supply the workmen. My companions at the press drank every

day a pint before breakfast, a pint at breakfast with his bread and cheese, a pint between breakfast and dinner, a pint at dinner, a pint in the afternoon about six o'clock, and another when he had done his day's work. I thought it a detestable custom; but it was necessary, he supposed, to drink *strong* beer that he might be *strong* to labour. I endeavoured to convince him that the bodily strength afforded by beer could only be in proportion to the grain or flour of the barley dissolved in the water in which it was made; that there was more flour in a pennyworth of bread; and therefore, if he could eat that with a pint of water, it would give him more strength than a quart of beer. He drank on, however, and had four or five shillings to pay out of his wages every Saturday night for that vile liquor—an expense I was free from. And thus these poor devils kept themselves always under." In those days four or five shillings meant considerably more than they do in the present time, and thus the workmen must have impoverished themselves and their families considerably by such habits, besides injuring their constitutions and those of their children. The workman quoted by Benjamin Franklin was no doubt a very temperate man in those debauched and drunken times, and thus some slight idea can be arrived at as to the drinking habits of the community. On another occasion this great man (at the time he was in London, little more than a boy) deeply offended his fellow-workmen by refusing to pay the customary *bien venu* of five shillings for an all-round drink which was expected of every workman when he is removed from one workshop to another, or when he newly entered a situation. I believe the custom still exists in London

workshops, but not to such an extent as formerly, and I don't think a man can be boycotted now for refusing to pay up. He stood out for three weeks against the custom, but he was so mercilessly treated by his fellow-workmen, that, despite his master's protection, he gave way and paid up. He managed to acquire after this a good deal of influence over them, and his own words, "I proposed some reasonable alteration in the *chapel* laws (a printing house is called a chapel by the workmen), and carried them against all opposition. From my example a great many of them left their muddling breakfast of beer, bread and cheese, finding they could with me be supplied from a neighbouring house with a large porringer of hot-water gruel, sprinkled with pepper, crumbled with bread, and a bit of butter in it, for the price of a pint of beer, namely three halfpence. This was a more comfortable as well as a cheaper breakfast, and kept their heads clearer. Those who continued sotting with their beer all day were often, by not paying, out of credit at the ale-house, and used to make interest with me to get beer, 'their *light*,' as they phrased it, '*being out*.'

Benjamin Franklin, in consequence of his sober, industrious habits, his clear head, his devotion to duty, rose to the eminence which he afterwards attained. He was a life-long total abstainer, and several times in his autobiography refers to the personal blessings which attended his simple habits of eating and drinking. The parts I have quoted will show, from the testimony of a reliable authority living at the time, the extent of the drinking habits in England amongst the working classes, before any legislation was considered necessary at all.

The authors, journalists, and poets of the time also are found to write about the degraded condition of the people through drink, and latter-day historians (Lecky, etc.) of those times refer to it also. Hogarth painted the morals of the eighteenth century, and his pictures represent a society given over to drink, gambling, debauchery and vice of every kind and degree. Politicians indulged in drink, and often attended the House of Commons in a state of intoxication. The elder Pitt, the great Earl of Chatham, was a martyr to gout, and for a period of twenty months at one time was unable to attend to his parliamentary duties. He might have lived many years longer than he actually did if the disease had not enfeebled his constitution to a disastrous extent. His son inherited gout, and died at the early age of forty-six, from the poison attacking one of his vital organs, in 1806. Of him it is said that attending the House of Commons one day under the influence of drink, with the politician Fox, he uttered the remark, "I see no speaker," whereupon his friend, who was in a similar state of intoxication, replied, "And I see two." Both these brilliant orators and statesmen, the Pitts, father and son, were the victims of the habits of their times, and indulged in intoxicating liquors, ignorant of the effects these were having upon their lives and health. There is little doubt that the lives of both William Pitt the younger and William Pitt the elder were shortened by gout, one of the diseases directly due to rich living and reckless drinking, and the country was deprived of the brilliant intellect and patriotic devotion of two men through the influence of a potently pernicious drug.

In the present century, and especially of late years,

there has been increasing agitation amongst the public for legislation on the liquor traffic. The Permissive Bill, the Direct Veto, Local Option, Saturday and Sunday closing bills for different places and towns are the outcome and awakening of public opinion, and of the necessity of reform. Sir Wilfrid Lawson's Local Option Bill, whereby a district will have in its power, by a majority of two-thirds, to refuse the granting of a liquor license on application, has, on each reading of late years, gained a decided majority in the House of Commons, and yet it never arrives beyond the second reading. There is no enthusiasm about the question by the great majority of those even who uphold and vote for its principles; and the Government, unless forced by a strong national feeling, which does not yet exist, will never make it a Government question, because there are too many interests involved. The imperative demands which this question ought to make on the attention and consideration of our legislators are constantly being ignored, and even Mr. Conybeare's late Bill regulating the sale of intoxicating liquors to children of tender years was mutilated and rendered useless. This is indeed a crying shame upon our civilization that the interests and welfare of our poor neglected little street waifs are beneath the consideration of men who are employed to protect the weak and succour the helpless. In Scotland, quite recently, a census has been taken of the popular feeling with regard to the direct veto, and it was found of the leading and smaller towns, numbering about fifty, there were 71,408 ratepayers who voted for the direct suppression of the liquor traffic, and only 5,527 against. In Glasgow a remarkable result was obtained: 77,246 voted in favour of the people

having the entire control of the liquor traffic by their votes, and 8,535 only were against. In answer to the question whether they would vote in favour of the prohibition of all licenses for the common sale of intoxicating liquors, 57,704 answered in the affirmative, and 19,411 against. Surely the people of Scotland should have their wishes, expressed so undeniably on the matter, respected, and a law passed to carry them into effect. The Sunday Closing Acts may have resulted in some amount of good in localities here and there, but it is also certain that they have been rendered nearly useless by the existence of clubs where drink could be obtained at the prohibited hours. In Wales this has been the case in numberless instances, and a great outcry has arisen against these so-called clubs. And then, again, it must not be forgotten that if a drunkard, or one who will have his drink, knows that the public-house will not be open on Sunday, he will be sure to lay in sufficient stock on the Saturday to last him over till the Monday. There is nothing to prevent him from spending every farthing of his wages on Saturday night in Alcohol instead of food. Besides, such a law is directed against the poorer classes, and does not touch those who have a well-stocked wine and spirit cellar, and who can have their Alcohol in by the hundredweight. Thus an injustice creeps into the system, and the saying that in England there is one law for the rich and another for the poor becomes a fact. Sunday Closing Acts have resulted in producing greater order in the streets on that day, but they have by no means grappled with the drink question, and I doubt whether their existence has diminished the revenue as much as a thousand pounds during the year. Of the

twenty-nine Bills before Parliament during the session of 1887, only one, dealing with the closing of the public-houses one hour earlier in Scotland, received any attention, and even that was mutilated in the Upper House. The large towns (where perhaps the Bill was most needed) were struck out, and it was made applicable only to the small towns of Scotland.

In the above manner is one of the most crying evils of our country dealt with! We are not ashamed of the vice which plays havoc with the bodies of thousands of our fellow-creatures, which shatters the constitution of our children, which fills our gaols, workhouses, hospitals, and lunatic asylums with its victims, which wastes hundred of millions of the public money upon a useless, injurious article! We are not ashamed of these things, but allow our vice to fatten and flourish, to reap its gruesome harvest in the wholesale slaughter of infants' lives, in the post-mortem room, in the execution yard, in the prison cell, in the pauper's grave! The wreck of fair homes, the ruin of childhood, the despair of a mother, the shriek of the suicide, the darksome crime are as nothing against the freedom of the individual to get drunk how, when, and where he likes! One can only exclaim with Shakespeare: "Can such things be, and pass us like a summer shower without our special wonder."

CHAPTER II.

A SHORT REVIEW OF THE HISTORY AND NATURE OF ALCOHOL, AND ITS DISPOSAL IN THE ORGANISM.

(*a*) Review of the History of Alcohol.[1]

From the earliest records we possess of the history of mankind we find that fermented drinks play an important part in their habits and customs. Intoxication, the effect of over-indulgence in fermented liquors, has been commented upon, condemned and legislated against by nearly all the great writers and rulers of ancient times. From the writings of Confucius, and his disciple Mencius, who died 478 B.C. and 288 B.C. respectively, we find several references to the vice of drunkenness, and exhortations to live soberly and virtuously. In some Chinese writings, written long before the period of these two eminent men, a thousand years or thereabouts, it appears that the vice of drunkenness was very extensive, so much so that the Chinese were threatened with speedy ruin, and death was recommended by one of their legislators as a fitting punishment for drunkenness. "If you are told that there are companies who drink together, do not fail to apprehend them all and send them to Chow, where I *will put them to death.*"[2] The Chinese wines were

[1] "The Announcement about Drunkenness."
[2] Samuelson's "History of Drink."

prepared from the fermentation of cereals, and notably of rice; it cannot be ascertained with certainty whether the process of distillation, by which pure Alcohol is obtained, was known to the Chinese so long ago, although the word spirits, besides that of wines, recurs frequently in their poems and prose writings. It appears that as the Chinese became converted to the Buddhist religion, the habits of excessive drinking diminished, otherwise it would be difficult to explain the persistence of the Chinese as a nation with the frightful licentiousness and drunkenness which were the characteristics of all classes of the people some 1,200 years before the birth of Christ.

In ancient India wine was used as a sacrifice to the gods, and over-indulgence particularly took place on the occasion of religious feasts. Soma and Sura were the two principal intoxicating drinks, and two of their deities bore the same names. The Buddhist religion, however, forbade the use of intoxicating liquors both by the priests and in the religious ceremonies. Soma and Sura were the drinks of the Brahmans, and are frequently mentioned in the Rig-Veda; they were prepared in a special manner from Indian plants of different kinds, and mixed with a variety of other things to give them a strong and pungent flavour. The Sura is said to have been by far the more intoxicating of these two liquors, and arrack was another drink prepared from the fermentation of rice. The evils arising from drunkenness became so widespread, so conducive to crime and vice of every description, that at last it was denounced in the strongest language by a law-giver named Manu, who carefully described the different forms of punishment

and penance to be endured by those who indulged in intoxicating liquors. Some of these are very ghastly, and with a superstitious people bound much more by the religious writings of their priests and law-givers than the more enlightened and independent nations of the West, doubtless did much towards bringing the people to a more sober and virtuous mode of living. Since the English have ruled in India, a very disastrous and deplorable condition of things has resulted, and is yearly getting worse. Encouragement has been given by our Government there for the manufacture of all kinds of intoxicating drinks, in order to increase the revenue; and we now find that even in the most sober communities, where drink is forbidden by the laws, customs, and religion of the people, the evil is spreading with lightning rapidity, and bids fair to bring ruin upon them, and disgrace upon the rulers who profess to be a Christian and civilized people.

In ancient Greece and Rome, in Persia and Egypt, wine was made and drunk with the same effects as elsewhere. Only in Sparta does total abstinence seem to have been advocated and enforced. To withhold the higher class Spartans from this particular vice, the Helots or slaves were made to drink to intoxication once every year, and the revolting excesses, unbridled licentiousness, and infuriated actions which resulted from this indulgence were witnessed by their sober masters with infinite disgust and loathing. In the other countries, as wine was more cunningly manufactured from all kinds of fruit and grain, drinking became as common a custom as in ancient China and India, and the same ill-effects followed in its train. Drunken orgies were

indulged in both by men and women at every conceivable opportunity. Funerals, births, weddings, and celebrations of victories after war, were looked upon as justifiable occasions for excessive indulgence in drink, and the most disgusting and horrible scenes were enacted under its influence. Many battles were preceded by similar orgies in ancient times, and this was undoubtedly the cause of defeat after defeat being sustained by the Romans at the hands of those fierce wild Northern hordes whose bodies and brains had not been weakened and enervated by delusive Alcohol or gluttonous living. It is quite certain that the downfall of all these ancient nations was preceded by a period of unexampled vice, licentiousness, and crime, either the direct outcome of indulgence in fermented liquors, or fostered and encouraged by them to an inordinate extent. Even a slight knowledge of ancient history must bring the student to this conclusion, for the greatness of no nation has ever suffered or been impaired as long as its people were strict in their observance of temperate modes of life, of a high ideal of purity of conduct, and simple rules of eating and drinking.

The Mahommedans in all countries were forbidden by their Koran to indulge in ardent drinks; but this law does not seem to have prevented a great many of them from indulging in them to excess. But of all religions and peoples, the Mahommedans, both of ancient and modern times, seem to be the most temperate with regard to their drinking habits. It has often been argued by anti-teetotalers that on this account the nations where Mahommedanism exists should be, from the temperance reformer's point of view, amongst the

most enterprising, prosperous, and civilized of nations. We know that such is not the case; but it is quite certain that if the Mahommedan countries had been addicted to the excessive use of alcoholic liquors, their inhabitants would have been in a far lower condition of progress and civilization than they are at present. And it must not be forgotten that the enterprise and skill of a nation, and the development of its commerce and arts, have very much to do with the geographical position of a country, its atmospheric conditions, and the resources of its soil. A higher and sturdier quality of character, a healthier and more robust organization, are better developed under certain conditions of climate and soil than under others, and these circumstances must be taken into consideration when dealing with the progress and development of a nation. The religion of a nation has also much to do with its higher mental and moral attributes, and with its individual and national aims and aspirations. Mahommedanism is not calculated to arouse the highest mental and moral development in its votaries, nor to develop all those sterling qualities and virtues which belong more strictly to Christian communities. The existence of polygamy, and its having the countenance of religion, are sufficient to lower the moral tone of the people who encourage and practise it; and in Mahommedan countries there is not any strong feeling against it, nor seemingly any desire to get rid of it. The Western nations have the vice of intemperance, but strenuous efforts are constantly being made by all classes and all religious sects to get rid of it. The more civilized and Christian races are never contented at remaining in an imperfect condition; there is a constant tendency to

move forwards and upwards, and that is why we see the Western nations so far in advance of the Mahommedan countries.

In the Old Testament we read that the Hebrews knew of wine, partook of it, and offered it as sacrifices in their religious ceremonies. The effects of drunkenness were well known, and total abstinence encouraged. The Rechabites, spoken of in Jeremiah, abjured intoxicating drinks, and to this day are pledged total abstainers. Abstinence from all forms of Alcohol is one of their most strict religious observances. Solomon inveighed against the effects of drunkenness, and summed them up in the following words, showing that in those days, as in these, the same physical manifestations and mental disturbances followed indulgence in alcoholic liquors. "Who hath woe? who hath sorrow? who hath contentions? who hath babblings? who hath wounds without cause? who hath redness of eyes? They that tarry long at the wine. Look thou not upon wine when it is red, when it giveth colour to the cup, when it moveth itself aright. At last it biteth like a serpent; it stingeth like an adder." Although the vice of intemperance was known amongst the Hebrews, and condemned by their teachers and writers, yet it does not seem to have wrought such havoc, and brought about so much licentiousness and debauchery, as we have noticed in the other ancient nations. When Christ came amongst the Jews, he had not to exhort them constantly to sobriety of life, to abstinence from a pernicious custom, as he would most certainly have done if drink had been causing the amount of physical and moral harm amongst them that is possible. There was not a single

failing, vice, or shortcoming of the Jews that Christ did not observe and comment upon. He certainly would not have overlooked the vice of intemperance with all its concurrent horrors, and would have denounced it with as solemn and prophetic words as he did the hypocrisy of the Pharisee, the treachery of a Judas.

The Jews are without doubt the most sober portion of any community. I think that this character for sobriety has been handed down to them from long centuries in the practice of that virtue, and doubtless the Jews of Christ's day were not given to drunkenness, and the particular vices, crimes, and diseases which belong to it. St. Paul inveighed particularly against the vice of intemperance when he travelled abroad, and saw its effects upon the Romans, the Greeks, and others. He was then strong in his denunciation of drunkenness, as probably for the first time he witnessed its awful effects upon the conduct, character, and customs of a people. He saw nations ruining themselves in debauchery and riotous living, becoming enervated and emasculate. He saw that there was nothing to withhold them from certain wreckage but return to the simplest and severest modes of life. No power could save them but placing before them once more high ideals, lofty aims, and simplicity of life. The few were saved who embraced this new religion, this light in the darkness, this high ideal of human conduct; the many were swamped in the pitiless torrent of barbarianism which poured down upon them from the plains of the North.

Tracing up the habits and customs of different nations to our more recent times, we find that drinking, with its concomitant vices, was very general amongst all classes,

and in many instances excessive. The monasteries and convents of the Middle Ages were by no means total-abstaining institutions; and monks and nuns, especially the former, were often found in a state of inebriety, owing to their alcoholic excesses. The manners throughout general society were rough, coarse, and even brutal; and the women were little better than the men in this respect. The nobles and knights of the period were guilty of the greatest infractions of decency in their drunken orgies; and modesty, as we understand it now-a-days, was almost unknown. The writings of Chaucer, Rabelais, Fabliaux, Froissart, and Boccaccio all contain references to the supposed pleasures and enjoyments of the wine cup; and Rabelais in particular revels in describing the excesses and obscenities to which his heroes gave way under the influence of strong drink. The Bardolphian nose of one of his heroes, as depicted in the illustrations of his work, shows that the physical effects of Alcohol were the same in those days as in these. Later on, in our own Shakespeare, we have a picture of the drinker which is a perfect clinical study. Who has not made the acquaintance of the loose, immoral, hard-swearing Falstaff? Who cannot picture his round red face, his swollen and inflamed lineaments, his bleared eye and uncertain gaze, his ponderous corporation,—"Indeed I am in the waist two yards about," he says of himself,—and the appearance of old age without its dignity? He was a type of the times, and Shakespeare saw many such. His study of the drink question (allowing even that he may have indulged himself, of which we have no sure guarantee) was thorough and complete, as witnessed by many of the wise sayings, summed up in a nutshell, of which

he was the author. "Oh that men should put an enemy in their mouths to steal away their brains, that we should with joy, revel, pleasure, and applause, transform ourselves into beasts!" says Cassio after being betrayed into an excess of drink by Iago. Such words might well be the text of many a temperance sermon, as they contain one of the weightiest arguments in favour of total abstinence.

The drinking customs of England must have been very excessive in Shakespeare's days for him to have made the following scathing remarks:—

"*Cassio.* 'Fore heaven, an excellent song (referring to a drinking song).

Iago. I learned it in England, where, indeed, they are most potent in potting: your Dane, your German, and your swag-bellied Hollander,—Drink, ho!—are nothing to your English.

Cassio. Is your Englishman so expert in his drinking?

Iago. Why, he drinks you, with facility, your Dane dead drunk; he sweats not to overthrow your Almain; he gives your Hollander a vomit ere the next pottle can be filled."

When Cassio, who is naturally a sober man, who dislikes to join in the drinking orgies, but who is weak and is overruled, comes out of his intoxicated condition, he exclaims, "Oh, I have lost my reputation! I have lost the immortal part, sir, of myself, and what remains is bestial;" and again, "Drunk; and speak parrot; and squabble; swagger; swear; and discourse fustian with one's own shadow! Oh, thou invisible spirit of wine, if thou hast no name to be known by, let us call thee devil!" His disgust is so great at his recent indiscretion, and its result in a duel with Montano, that he cannot scourge himself with words of too great denunciation; he

exclaims, "I will ask him (Othello) for my place again: he shall tell me I am drunkard! Had I as many mouths as Hydra, such an answer would stop them all. To be now a sensible man, by-and-by a fool, and presently a beast! Oh, strange! Every inordinate cup is unblessed, and the ingredient is a devil." It was very much the fashion then, as it is now-a-days, to compare a drunken man with a beast. In my opinion the comparison is a sorry one, and very odious for the four-footed creation. The few instincts animals possess are inimical to strong drink, as can be seen by their aversion to it after they have been inveigled into taking it once. Neither the instincts nor the brain of man have been sufficiently strong to make him turn away with disgust from the "inordinate cup." In this he shows himself lower than the animals. Even the painfully disgusting manifestations of drink, in which man completely parts company with all his higher nature, in which he sinks down the victim of all his grosser passions, becomes a brawler and a savage, a maudlin imbecile or a raving lunatic—even these do not educate his instinct or his intelligence to draw a logical conclusion from the practical lesson. No, there is no comparison between a man in drink and the lower animals; he is simply a travesty of his higher self, an ignoble portrait of himself, a sad and terrible picture for the study of the seeker after truth.[1]

It has often been argued that if the different countries were plunged to such an universal extent in the vice of

[1] Swine are unclean animals, and revolting in their habits. It is possible that these animals are particularly referred to when a man is compared to a beast. Otherwise the comparison is not a fair one.

intemperance, with all its accompanying consequences, how were they able to maintain any existence at all? Why did not humanity perish from its own viciousness, or sink into irretrievable degradation? We have seen that many ancient nations were destroyed by their own excesses, and the vices and crimes which crept up amongst them. The modern European nations of which I am now speaking, the France, Germany, Italy, Holland, and England of the Middle Ages, were young countries, scarcely outgrown barbarism. They were struggling into existence, and it was a question of the survival of the fittest with their inhabitants. The luxuries of life were unknown, and the struggle for food, wearing apparel, and shelter, must have been so great as to prevent a large number of the working classes from wasting their hardly earned pence upon intoxicating liquors. Although we have no means of knowing the fact for a certainty, yet we can gather from our present experience that the mortality both of infants and of adults must have been enormous, for the comforts which are every poor man's possession now-a-days were unknown in the families of princes and nobles of former times. The Dark Ages are truly named dark, from our ignorance of them, and from the low standard of civilization at which they stood. Later on we get our chroniclers, poets, and historians, giving us a peep into the manners, habits, and customs of our ancestors, and we know that these must have been an improvement upon the Dark Ages, but were, as compared with present times, very rough, coarse, and unrefined. The licentiousness, dissoluteness, and intemperance of the Middle Ages received a check with the introduction later on of Protestantism. We know that the

proceedings of the Church of Rome were spreading disgust and revolt in the souls of all high-minded, honourable men. The majority of the monasteries and convents were hotbeds of vice, and the despotism of the Popish edicts was directed against freedom of men's thoughts rather than against the freedom of their actions. The reaction against the despotism of one man and the vices of the many was a great and salutary one, and was effected through the splendid personality of a Luther. But the seed was ready to germinate in the minds of men, and fell upon good ground. The light of the new creed spread with marvellous rapidity, bringing men and women to their senses, inculcating a nobler ideal of life, a loftier and purer form of religion. Like a drowning person who clutches at a straw, so clutched humanity at this new light, and for a time the influence of Luther and his followers checked the growth of vice, crime, and intemperance.

Nothing could have been much more licentious in tone, degraded in morals, than the court of King Charles II.; but all the while there existed a strong Puritan sentiment in the country which acted as a spoke in the wheel. It is often brought against the Puritans that they were psalm-singing hypocrites, no better than the Cavaliers they criticised and condemned. This accusation cannot be borne out with any justice or historical accuracy. Possibly some few Puritans belied the cause to which they belonged, were hypocrites, drunkards, and otherwise licentious in their lives; but the large majority of them were almost fanatically espoused to the cause of simplicity of life and purity of morals. If it had not been for this powerfully restraining influence in the

country, England must long since have become a vanquished nation; it is this backbone of Puritanism which has saved her all along. The same element exists to-day, and is more or less widespread throughout the nation; and if it were not so, our civilization, with its awful pauperism on one hand, its unbridled luxury on the other (both favouring intemperance and vice), would be its ruin. Thus, through the intemperate customs of the Middle Ages, of the Shakesperian era, of the court of Charles II., of the last century and of to-day, the leaven of Puritanism or the reaction of the Reformation has been amongst us, and has prevented a universal descent into ignominy, shame, and defeat. And then, again, when a nation is not too far steeped in degrading vices, in slothful ease, and enervating pursuits, which make it an easy prey for a stronger race, it has wonderful powers of recuperation. Nature herself is an example of this power in individuals, in families, in societies, and unless she is wantonly outraged will recover herself almost miraculously. If nature avenged herself always for the affronts she receives through our ignorance, prejudices, and superstitions, there would be very few human beings on the face of the world; but she defies our strongest efforts at self-destruction, revives once more, begins afresh her work, and persists. The recuperative powers of Nature are illimitable, and this is one of the reasons why nations do not succumb under their vices, and if they do not become a prey to stronger and more virtuous races, may recover themselves sufficiently to carry on the work of life.

We are at the point in our own history when we witness on every side the weakening and vitiating effects, mentally, morally, and physically, of alcoholic liquors.

The whole nation fortunately is not steeped in the vice, and the Puritan element of simplicity of life is still strongly implanted amongst us, and is indeed undergoing a great revival, especially with a view to stamping out the source of so much evil. There is no doubt that with the spread of education, the advantages of civilization, and the enlightened public spirit which characterizes us, our nation will not succumb to its terrible vice, and become subject to another and an alien race; she will conquer her weaknesses, will cherish her strength, and will continue, by her daring, her enterprise, and her courage, to be foremost amongst the nations of the earth, as heretofore.

(*b*) The Chemistry of Alcohol.

Alcohol is obtained in two different ways; viz., *Fermentation* and *Distillation*. The first named, fermentation, has been known by man from the earliest historical records, and was the process by which the different wines and alcoholic drinks of ancient times were obtained. Distillation, unless known to the ancient Chinese, was not discovered until about the eleventh century, when it seems to have originated in Arabia by one of the learned alchemists of that country, Albacasis or Casa by name. The discovery soon passed into Europe, and was for many centuries confined to the laboratories of a few learned philosophers, at that time looked upon by the general public more as magicians and sorcerers than as men of science. They obtained the distilled spirits in small quantities at first by the simplest means at their disposal, and its effects upon the human body were looked upon as so marvellous, so

subtle, that the devil, who then played a very important part in the affairs of the world, was supposed to have had a hand in the matter. The chemists themselves were alleged to be in league with Satan, to have bartered their souls to him, in order to procure this mysterious and wonderful fluid. However, as time passed on, and people became more enlightened, as the demand for this spirit increased, and its utility in the arts, sciences, and commerce became more apparent, these ideas gradually dwindled away, and soon died out altogether. The manufacture of spirits by distillation was conducted on an ever-increasing scale, and now the different countries are studded with distilleries. The word Alcohol, which is the generic term for all the various kinds of spirits, is supposed to be derived from the Arabian word Al-ka-hol, which, according to the authority of Bartholomew Parr, was a very fine powder used by the women of Eastern countries to darken the hair and eyelids. "As this powder, viz., an ore of lead, was unpalpable, the same name was given to other subtile powders, and then to the spirit of wine exalted to its highest purity and perfection."[1] The term Alcohol did not come into general use until long after its discovery; but as it is meant to express something intangible, fine, subtile, and evanescent, it is as appropriate as any other would have been for the purpose.

Fermentation. (Ferveo, to boil.)—This is a particular process due to the presence of a ferment in a vegetable substance undergoing putrefaction. We can produce fermentation in sugar if we expose this substance to

[1] Cantor Lectures. Dr. B. W. Richardson.

certain conditions. These conditions are simple but indispensable. They are air, water, warmth, and the ferment. This last may consist of common yeast, which is the most powerful ferment known; the temperature must be regulated between 64° F. and 75° F., or 18° C. and 24° C. It is owing to the *yeast-cell*, otherwise known as the *Torula cerevisiæ*, that the sugar is converted into Alcohol and carbonic acid. These cells are minute organisms, invisible to the naked eye, and capable of immense powers of reproduction. They are a very low form of vegetable life. Their activity in the presence of any saccharine substance, combined with air and water, gives birth to four separate products:—

1. A very poisonous vapour given off from the surface.
2. A froth, capable of acting as a ferment in other substances.
3. A clear liquid found underneath the froth, of varied colour and taste, according to the vegetable, plant, or fruit from which fermented. This is the wine.
4. A heavy semi-solid mass at the bottom of the vessel, the lees.

The experiment for obtaining the above can be easily performed by the amateur with some amount of dexterity, and a slight knowledge of chemical laws. Grape-sugar or some saccharine substance is dissolved in about eight parts its weight of water, and is put into a stoppered glass bottle with a little yeast which is already undergoing putrefaction. One end of a bent glass tube, communicating with the interior of the bottle through the middle of the cork, is passed under another bottle, which is inverted over a vessel containing water, the temperature being 60° and 70° Fahr. The evolution

of gas will soon begin in the bottle containing the saccharine substance and yeast, and the poisonous vapour or gas will pass over through the tube into the receiving bottle. This process can be made to continue until all the sweet taste has left the fermenting liquid, which gradually acquires a spirituous flavour. The residue or lees consists of a brownish mass, and will be found at the bottom of the vessel. The following chemical change will have taken place:—

$$C_6H_{12}O_6 = 2C_2H_6O + 2CO_2.$$
Grape-sugar = Alcohol + Carbonic acid gas.

The fermented liquid obtained will be found to consist not only of one form of Alcohol, known as Ethylic Alcohol, but of some of the higher Alcohols, such as Propylic, C_3H_8O; Butylic, $C_4H_{10}O$; Amylic, $C_5H_{12}O$ (this is commonly known as potato-spirit or fusel oil, and is a very powerful form of alcoholic spirit); Hexylic, $C_6H_{14}O$; Heptylic, $C_7H_{16}O$.

Ethylic Alcohol, or C_2H_6O, is formed in the greatest quantity during the fermentation of sugar.

There is a lower form of Alcohol called Methylic Alcohol, which has the formula C_2H_4O, and which is produced from the destructive distillation of wood. It generally goes by the name of naphtha, or wood-spirit.

It will be seen from the above that the alcoholic group consists of three elements in varied proportions. These are carbon, hydrogen, and oxygen. The last, oxygen, is always in the proportion of one, whereas the former, carbon and hydrogen, advance in regular rotation, adding one atom of carbon and two atoms of hydrogen in each case.

Methylic	Alcohol or wood-spirit . . .	$C H_4 O$.
Ethylic	„ (common Alcohol) . .	$C_2 H_6 O$.
Propylic	„	$C_3 H_8 O$.
Butylic	„	$C_4 H_{10} O$.
Amylic	„ (Fusel oil or potato-spirit)	$C_5 H_{12} O$.
Hexylic	„	$C_6 H_{14} O$.
Heptylic	„	$C_7 H_{16} O$.

Hydrogen and oxygen are elements which, by their combination in the proportion of two parts of hydrogen to one part of oxygen, form water ($H_2 O$). Separate, they are colourless, odourless gases.

Oxygen is found in the atmosphere combined with a gas called nitrogen, in the proportions of 21 parts of oxygen to 79 parts of nitrogen in 100 parts.

Carbon is a solid; its commonest form is as charcoal. A diamond is carbon in its very purest form.

The first four Alcohols mix very readily with water, in fact are greedy for water, and will withdraw it from whatever they come in contact with containing that element. Butylic Alcohol does not combine so readily with water, only in the proportion of one to one and a half, and Amylic and Hexylic are insoluble in water.

To distinguish one form of Alcohol from the other, the following fact is observable,—that the heavier the Alcohol that is being burnt, the greater amount of soot is deposited therefrom, because the oxygen of the atmosphere is not sufficient to consume all the carbon. This test is often applied to suspected liquors to discover whether they are adulterated with the more poisonous and stronger Alcohols. There is no deposit of soot from the burning of either Ethylic or Methylic Alcohol.

The vapour density, boiling point, and specific gravity vary in the different Alcohols. Whereas the vapour

density of Ethylic Alcohol is 23°, its boiling point is 172° Fahr., and its specific gravity 792 (compared with water 1000). The vapour density of Hexylic Alcohol (the highest on the list) is 51°, its boiling point is 302° Fahr., and its specific gravity 821. The other Alcohols in the group vary between these two extremes, and wood spirit or Methylic spirit has a still lower vapour density and boiling point, whilst its specific gravity is higher.

Besides the Ethylic and other forms of Alcohol given over by the fermentation of glucose or grape-sugar, it is now found that a small percentage of other substances is also produced. These are succinic acid ($H_2 C_4 H_4 O_4$), 0·5 per cent.; glycerin ($C_3 H_5 (H O)_3$), 3·5 per cent.; and cellulose ($C_6 H_{10} O_5$), 1·5 per cent.

It has been remarked with great truth by an eminent French chemist, Monsieur Fourcroy, in his "Philosophy of Chemistry," published in the last century, that "the fermentation of Alcohol takes place at the expense of the *destruction of a vegetable principle.*"

A solemn fact which ought never to be lost sight of in our consideration of the drink question, is that destruction and putrefaction are the two sources of Alcohol. An enormous amount of good, wholesome food in the form of cereals, plants, fruits, etc., is yearly wasted in this destructive process to produce a noxious beverage for man's use.

The above simple process I have recommended for the production of Alcohol from the fermentation of glucose or grape-sugar must be regarded as an artificial one; fruits and vegetables, if allowed to putrefy, will produce it without the aid of any vessel.

Wines.—These are obtained from the fermentation of different fruits, which contain the saccharine substance and the fermenting principle in themselves. The latter is found in the albuminous parts of the fruit, which will soon develop the yeast-cell under the conditions before mentioned. If the juice be freshly expressed from some such fruit as the apple, and submitted to a temperature of about 70° Fahr., it will soon be converted into a spirituous liquor, with an underlying deposit. This is apple-wine or cider.

The beautiful grape, with its fresh sweet savour, its thirst-satisfying quality, is the fruit most largely used in the production of wine. The juice is pressed out of the skins, and is poured into large wooden tubs, which are placed in underground vaults. As the temperature is not very high, the process of fermentation is a lengthened one, and sometimes lasts several months. Even then it is not complete, as the wine has not yet parted with all its saccharine substance, so it is poured from the original vats into others, where it is submitted to the same conditions, until all the sugar and the fermenting principle have been converted into Alcohol. White wine, generally found along the course of the Rhine and the Moselle, is made from the white grape.

Red wine is obtained in the same manner, excepting that the skins and stalks of the fruit are allowed to remain whilst the process of fermentation is proceeding. The grapes used in this instance are the purple-skinned variety. A colouring matter is thus given to the wine, and tannin is thrown down from the seeds and stalks. The astringent taste which is so much appreciated by some wine-drinkers is imparted to the red wines by the

amount of tannin present. There is a peculiar acidity in most wines, and this is due to the presence of acid tartarate of potash, which is found in the grape. The sparkling wines, like Champagne, are obtained in the following manner. After the first fermenting process is over, and before all the sugar has been converted into Alcohol, the liquid, instead of being turned over into fresh vats, is poured off into bottles and securely corked. The effervescing carbonic acid gas is thus retained in the liquor, and bubbles up through the wine when it is released, giving it the pretty sparkling appearance and the frothy surface which are so much appreciated by its admirers.

The composition of the grape is as follows :—

	In 100 Parts.
Water	80·0
Albumen	0·7
Sugar (glucose)	13·0
Tartaric acid	0·8
Pectose and gum	3·1
Cellulose	2·0
Mineral matter	0·4

Distillation of Spirits.—This is the process by which water is separated from the Alcohol it contains. The vapour coming off from Alcohol, when the latter is boiled at a temperature of 172° Fahr., is received into a vessel called a *still* (which is surrounded by cold water or ice), on the sides of which it condenses in drops. There is generally some portion of water contained in the first distillation of Alcohol, and in order to obtain what is called the *spirit* of wine the liquid is again submitted to the same process, and still more water is

evaporated. The *Rectification of Spirit*, or rectified *spirits of wine*, is still a further process by which more water is evaporated off, but even then a certain percentage is left, about 10 to 20 per cent.

Absolute Alcohol, that is, Alcohol containing no water at all, is very difficult to obtain, and can only be achieved by the most powerful chemical means. Alcohol has such a strong affinity for water that to obtain it absolutely pure is almost impossible, but it is done by means of quicklime by a very complicated process.

Spirits can also be obtained by fermentation as well as by the distillation of wine explained above. The process by which they are obtained differs from that of the fermentation of wine, and more nearly approaches that by which beer is manufactured.

Beer and Spirits.—The materials employed are those which contain large quantities of *starch* instead of sugar. The starch has first to be converted into sugar before the process of fermentation can be set up, because Alcohol and carbonic acid cannot be obtained direct from this material. Wheat, rye, barley, potatoes, and other grain are the substances most employed for the manufacture of beer. Whichever grain is used has first to undergo the complicated process of "malting," which takes about fourteen days. At the end of that time the original grain is found to have submitted to certain changes, the principal of which is the conversion of its starch into a substance called dextrin (a species of gum) and a sugar. This change has been brought about by the presence of a peculiar substance in grain called *diastase*, of which the properties are not yet well known.

Water is then added to the malted grain, which is first

crushed, and the "wort" or "sweet wort" is produced after the solid parts have been dissolved out. The "wort" is then submitted to the process of fermentation at a temperature of 60° to 90° Fahr., just in the same manner as the juice of the different fruits to obtain wine. The sugar is converted into Alcohol and carbonic acid gas, some of which is allowed to remain to render the beer frothy. Hops are added to the wort whilst the fermenting process is taking place, and these impart an agreeable and bitter taste, owing to an aromatic and bitter principle which they contain.

An immense quantity of brewer's yeast is formed whilst the above process is going on; it rises to the surface, and is often forced out of the casks through the active evolution of the carbonic acid gas.

To obtain *spirits* the fermented mass is placed into a metal (mostly copper) still, and Alcohol is distilled in the same manner as distilled spirits of wine.

Beer is formed of the following compounds:—

Water	80–90 per cent.
Alcohol	3–8 „
Dextrin	4·5 „
Albumin	0·5 „
Sugar	13·0 „
Acetic, lactic, succinic acids .	0·3 „
Carbonic acid gas . . .	0·15 „
Mineral matter . . .	0·3 „

Adulterated beer is often found to contain injurious substances, sometimes even poisonous, producing headache, nausea, and vomiting in those partaking of it. The "Cocculus Indica" has largely been used to give bitterness to beer, and this substance has a decidedly

narcotic effect. Salt is introduced in order to produce feelings of thirst in the consumers.

Distilled spirits of wine are introduced into the wines to give them a stronger flavour, and also with the object of preserving them for exportation purposes. Wines drunk on the spot where fruits are grown, and the manufacture is carried on, are never so strong in Alcohol as those which are imported and which have been "fortified."

Besides the tartaric acid principally deposited in the wines of grapes, there are oxalic, malic, and other acids found in our native wines, produced from gooseberry, currants, and apples, etc.

In what are called by connoisseurs wines and spirits of the best quality, a kind of oily-looking fluid is seen floating in small quantities. It is composed of certain compounds called ethers, formed by the mingling of the different acids of the wine with the Alcohol. The fragrance and flavour of wine are often owing to the presence of ethers.

One imperial pint of each of the following wines contains about—

Name of Wine.	Absolute Alcohol.	Tartaric and other acids.	Acetic Acid.	Sugar.	Ether.	Mineral matter.
	oz. grs.	grs.	grs.	oz. grs.	grs.	grs.
Hock . . .	1 219	39	18	none	4	16
Claret . .	1 306	31	18	0 9	6	18
Champagne	1 343	20	10	1 120	5	20
Burgundy .	2 18	24	17	0 10	6	18
Carlowitz .	2 35	36	19	none	5	16
Sherry . .	3 147	24	12	0 236	4	38
Madeira. .	3 218	26	18	0 175	5	33
Port . . .	3 218	23	12	0 359	6	20

The preceding table will give some idea of the percentage of Alcohol and other matters found in the different wines.[1]

Both in the composition of the above wines and in that of the different beers, it can easily be seen that the flesh-forming foods, or albuminoids, are altogether absent in the wines, and are only present in a very minute proportion in the beer—0·5 per cent. The heat producing foods, or carbo-hydrates, are also in very minute quantities in both cases, and are represented by the sugar in wines, and the sugar and dextrin in beer. The water is in the largest proportion, and then comes the Alcohol, which really plays the most important part in these different liquors. In the composition of the grape[2] the carbo-hydrate or heat-forming compounds are in large quantities, and gum, cellulose, and albumen far in excess of that found in the alcoholic beverages. Thus the rich and useful food-constituents of a fruit like the grape, so nutritious in their effects upon the body, are destroyed in the process of making wine, that beverage which by its peculiarly seductive influence upon the palate has held despotic and undisputed sway amongst the tastes and habits of mankind since time immemorial. I venture to say that if the Alcohol could be separated from the liquors containing it, the residue would not only be unpleasant, but downright nauseous, owing to the presence of the several acids and ethers already mentioned. They are not altogether harmless in their effects, and were they present in sufficient quantities would pro-

[1] "Food, etc.," by A. H. Church, M.A. South Kensington Museum Science Handbooks.

[2] Refer to page 84.

duce, in some cases, very unpleasant, if not dangerous, symptoms. It is the Alcohol alone in intoxicating liquors which renders them so palatable, and endows them with such a dangerous attraction. The horrible morning sickness, consequent on a heavy drinking bout over-night, may be often caused, not only by the effects of the Alcohol upon the nervous system and lining membrane of the stomach, but also by the poisonous influence of these other agents, with which the wine and spirits may be more or less charged. Sugar of lead is often added to champagne to produce a sparkling appearance; the presence of this poison, even in small quantities, may account for the splitting headaches, languor, and depression which often follow excessive indulgence in that wine.

In brandy, whisky, rum, and gin, the Alcohol has a far higher percentage than in beers and wines. It generally varies from fifty to sixty per cent., whereas in port, sherry, etc. it varies from fifteen to twenty-five per cent.

One imperial pint of each of the following spirits contains:—

Spirits.	Water.	Alcohol.	Sugar.	Other solid substances.
	oz.	oz.	grs.	grs.
Brandy.	$9\frac{1}{2}$	$10\frac{1}{2}$	80	50
Rum	5	15	18	$18\frac{1}{2}$
Gin	12	8	—	$11\frac{1}{3}$
Whisky	10	10	42	18

All these spirits, as sold by retailers, are found to contain solid substances of different kinds besides sugar.

These are introduced for the purposes of improving the flavour, and to produce an agreeable taste. French brandy is flavoured with dried plums, English brandy with caramel, burnt sugar, and the liquor known as imitation brandy, with "an artificial mixture of certain chemically prepared ethers." The smoky taste of whisky is due to the presence of a minute quantity of creasote, and it is often clarified after being removed from the sherry casks in which it has been placed (in order to give it a stronger flavour), by carbonate of soda and Epsom salts. Butyric ether is found in rum, and this liquor often receives the flavour of the pine-apple. Gin is a very complicated mixture, and contains a number of different ingredients. It is flavoured, after distillation from the fermented grain, with the oil of the juniper berry. I cannot do better than sum up this mixture in the graphic words of Dr. Richardson. "Gin has to be made cordial, to be sweetened, to be rendered creamy and smooth, to be flavoured, to be made biting to the palate, to be beaded, and what not else. To be made cordial it must be charged with oil of juniper, with essence of angelica, oil of bitter almonds, oil of coriander, and oil of carraway. To sweeten it, it must be treated with oil of vitriol, oil of almonds, oil of juniper, spirits of wine, and loaf sugar; to force down the same it must be further treated with a solution of alum and carbonate of potassa. To be rendered creamy and smooth, it must be lightly charged with a small quantity of garlic, Canadian balsam, Strasburg turpentine. To give it piquancy, it must have digested in it shreds of horse-radish. To be made biting to the palate, a touch of caustic potassa must be added." I think the foregoing description of

one of the favourite drinks of the poorer classes needs no comment. If it does not teach its own lesson, the moral stultification must indeed be in an advanced stage.

Has Alcohol or spirits of wine no use or virtues then at all?

Without doubt the discovery of this agent is one of the most meritorious man has ever made. It has been as useful to him in his scientific, artistic, and commercial progress, as it has been injurious to him as a beverage. It was found to burn without smoke or soot, and to give out a considerable amount of heat, therefore it was more useful in the chemist's laboratory than the smoke-laden, evil-smelling oils and fats formerly used. It was found also to possess the power of dissolving substances hitherto looked upon as insoluble, to extract the principles of various roots, seeds, and plants; to possess undoubted anti-putrefactive or preservative properties. The physician, the artist, the manufacturer, the anatomist were at last in possession of an article which made progress more easy for them in their different paths, which opened up avenues of thought and experiment hitherto only dimly perceived, because the wonderful agent had not yet been alighted upon. Sulphuric acid, or oil of vitriol, was obtained by the distillation of green vitriol (a green crystal found in the earth), and this oil added to Alcohol produced that thin, mobile, and volatile liquid which we call ether. It possesses a peculiarly penetrating and agreeable perfume, not unlike the smell of apples; is sparingly soluble in water, floating on its surface, and on that of Alcohol. It dissolves oils and fats, india-rubber, gutta-percha, also many resins. It produces a sensation of burning on the skin, and, when breathed upon, of in-

tense cold. It speedily evaporates, and is the lightest known substance. When inhaled it produces anæsthesia, and has been used in conjunction with chloroform, sometimes alone, for operative purposes. Dr. Richardson introduced it into surgical use in the form of the ether spray for minor operations. From Alcohol this wonderful liquid was obtained, and so also was a still more universally applied liquid, chloroform, which has been one of the most beneficent discoveries ever made by man. Chloroform has brought the science of surgery to perfection; it has done more to preserve life, to dispel pain, to bring relief to the racking and tortured body, than any other known agent up to the present time. Its discovery was due to the pre-existence of Alcohol, and was made simultaneously by a French chemist named Soubieran and the German chemist Liebig in 1831. The former, in one of his chemical experiments, distilled Alcohol upon the hypo-chlorite of lime, and chloroform was the result. It can be now produced by other methods.

To the scientific man Alcohol has been of immense service. The anatomical and naturalist's museums are filled with specimens of organic structures which could not possibly have been preserved with the same success in any other way than through this agent. It possesses the power of abstracting water from all animal and vegetable tissue, because it has a peculiar affinity—an elective affinity, as Goethe would say—for this element. It is the presence of water in decaying animal and vegetable matter which assists in promoting its putrefaction, but this process of decay and putrefaction can be arrested if the tissue or structure is placed in strong

spirit of wine and hermetically sealed. In this way are obtained the beautiful physiological and pathological specimens with which our scientific museums are filled, and which are so precious to the scientific worker. Many colouring dyes and varnishes have been added to those already known through the aid of this agent, and the many beautiful and subtle perfumes, which are manufactured in such variety and perfection now-a-days, owe their existence to the extractive action of Alcohol. A large majority of the drugs in the Pharmacopœia—the extracts and tinctures and spirits—are made from Alcohol, which we are taking in small doses when we are prescribed these different medicines. The claims of Alcohol are indisputable and manifold. In our denunciation of its use as a beverage, we must not overlook its value in other directions, as such a proceeding would rather weaken than enforce the arguments of temperance reformers.

(*c*) Disposal of Alcohol in the Organism.

During the latter half of the first fifty years of this century many experiments were carried on by scientific men, particularly on the Continent, to determine the place of Alcohol as a food for man. The great German chemist, Liebig, was one of the first to make a classification of foods; and although his experiments have been considerably modified and improved upon since his day, yet we still adhere to his division of all foods into heat-forming or respiratory foods (known chemically as hydrocarbon and carbo-hydrates) and flesh-forming or albuminoid foods (nitrogenous). Before giving a more detailed description of these foods, it would be as well to con-

sider shortly the composition of the human body, in order to judge more correctly of its food requirements.

The human organism is a very complex structure, and each of its many parts—the bones, muscles, skin, blood, etc.—are found to be made up of a great number of different substances, which form chemical compounds. I cannot do better than give the following list, which will present a very clear idea (allowing for changes which are constantly occurring in the body whilst living) of the composition of the different tissues and structures of the human organism. The list is taken from one of the South Kensington Science Handbooks, and therefore its accuracy may be depended upon.[1] In making our calculations, we assume that we are analysing (that is, *chemically* pulling to pieces) a man in perfect health, twenty-five to thirty years of age, five feet eight inches in height, and weighing eleven stone, or 154 pounds.

The human body is made up of the following compounds:—

		lbs.	oz.	grs.
1.	Water: found in every tissue and secretion .	109	0	0
2.	Fibrin and similar substances, forming the chief solid material of muscular flesh, and occurring in blood	15	10	
3.	Phosphate of lime: in all tissues and liquids, chiefly in the bones and teeth . . .	8	12	
4.	Fat: a mixture of three chemical compounds, distributed throughout the body . .	4	8	
5.	Ossein: organic framework of bones, chief constituent of connective tissue; yields gelatin when boiled	4	7	350

[1] "Food: Some Accounts of its Sources, Constituents, Uses." A. H. Church, M.A., Oxon.

		lbs.	oz.	grs.
6.	Keratin, with other similar nitrogenous compounds: forms chief part of skin, hair, nails, and weighs about	4	2	
7.	Cartilagin: a nitrogenous substance, the chief constituent of cartilage . . .	1	8	
8.	Hæmoglobin: a very important nitrogenous substance, containing iron; it gives the red colour to the blood	1	8	
9.	Albumen: a soluble nitrogenous substance, found in chyle, lymph, blood, and muscles	1	1	
10.	Carbonate of lime: found chiefly in bone .	1	0	350
11.	Kephalin, with myelin, cerebrin, and several other nitrogenized, sulphurized, or phosphorized compounds: found in brain, nerves, etc.		13	
12.	Fluoride of calcium: found chiefly in bones and teeth		7	175
13.	Phosphate of magnesia: chiefly in bones and teeth		7	
14.	Chloride of sodium (common salt): occurs throughout the body		7	
15.	Cholesterin, fuosite, and glycogen, compounds containing carbon, hydrogen, and oxygen: found in brain, muscle, and liver		3	
16.	Sulphate, phosphate, and organic salts of sodium: found everywhere . . .		2	107
17.	Sulphate, phosphate, and chloride of potassium: found everywhere		1	300
18.	Silica: occurs in hair, skin, and bone . .			30
		154	0	0

Of the materials given above the human body is composed, and these materials or substances are made up of the following elements, which united together form chemical compounds: hydrogen, oxygen, nitrogen, carbon, iron, sulphur, phosphorus, calcium, fluorine,

magnesium, sodium, chlorine, silicon, potassium, manganese, and copper,—sixteen in all. The food constituents of the body must contain the several elements in their various combinations which have just been enumerated, or else life could not be maintained from day to day. Water, which is a compound of hydrogen and oxygen (H_2O), is one of the most important constituents of food. It acts as a solvent of solid foods in the system, so as to render them into a semi-liquid state, easy of assimilation by the different tissues. It acts as a carrier of this semi-liquid food to all the various parts of the system, and constitutes more than two-thirds the whole weight of the body. Of the blood itself, water occupies as much as 790 parts in 1000. There is not a single tissue, structure, or organ of the body which does not contain water in larger or smaller proportion, and therefore it is one of the most important food requirements of the human system. It is calculated that every pound of dry food should be accompanied by four pounds of water, thus large quantities of water must be consumed in order to fulfil this natural law. Water is not only taken in the pure form, but it largely enters as a component part of the various foods we eat. For instance, 100 lbs. of bread contain 40 lbs. of water, 100 lbs. of cabbages contain 89 lbs. of water. In 100 lbs. of lean meat, 73 lbs. are water; and in 100 lbs. of fish, 74 lbs. are water, etc. Thus we consume very little really solid food. Water also assists in dissolving the different mineral salts which we take with our food, and it promotes the activity of the various secretions of the body forming their principal constituents. The elasticity of the tissues, the roundness of the contours, the proportion of the different parts, are

due to, and maintained by, the amount of water in the body. When there is a great loss of this primitive fluid in the system, as in cholera morbus, in severe forms of diarrhœa, in the disease called diabetes, there is a shrivelled and shrunken appearance, the skin becomes dry, the bony parts prominent, the hollows accentuated. Thus water is a beautifier as well as a necessity of the human form, and is better taken in its purest form for these purposes than in any other way. Man, in thinking to improve upon nature, has manufactured all sorts of decoctions and beverages, with which he has more or less vitiated his palate; and very few people, excepting children and total abstainers, partake of water in its pure and unadulterated condition. I have even heard men and women boast of the fact that they do not like water, and that as water it never passes their lips. As if it were reasonably possible in a natural condition to dislike a fluid which is tasteless, colourless, satisfying, and essential! Civilization must indeed have vitiated all the natural wants and propensities of mankind for such a state of things to be made a boast of.

Water, then, is an essential part of our food constituents. It is composed of the two elements or gases, oxygen and hydrogen, and serves the useful purpose of carrying nutrient material to all the different parts of the system, and bringing away the used-up or waste products with which the tissues are finished.

Besides water there is the mineral matter (or salts), also an incombustible compound like water, which is principally made up of chloride of sodium (common salt) and phosphate of lime. They enter into the composition of certain tissues, and assist in effecting changes in them.

There are certain foods which undergo combustion or oxidation in the body, and these are called combustible or respiratory foods. They are of two kinds: (1) carbon compounds; (2) nitrogen compounds. Starch, sugar, oils, fat, gum, mucilage, etc., come under the first heading, and are called carbo-hydrates and hydro-carbons. They are composed of the elements hydrogen, oxygen, and carbon, in various proportions, and maintain the heat, and through the heat, the energy and force of the body. The carbon combines with the oxygen in the tissues, which combination is called the process of oxidation or combustion. On this account these hydro-carbon foods are often called heat-givers or force-producers.

The nitrogen compounds are formed of the elements hydrogen, oxygen, carbon, and nitrogen. They are often called the flesh-forming foods, because they largely repair the waste of tissue which is continually taking place as long as life lasts. The fibrin of meat-muscle, the albumen of egg, and that contained in milk, the gluten of wheat, and the casein of cheese are examples of these nitrogenous or flesh-formiug compounds which the body requires. The great difference between these foods and the carbon compounds is the presence of nitrogen, which gives them their distinctive characteristic, and supplies this element to those tissues in the body which are largely made up of nitrogen, such as the muscular and nervous systems.

Now, as these albuminoid, nitrogenous, or proteid foods (as this class of food-stuffs is often called), contain carbon, this element is available as a source of heat aud work in the body, and very often supplies the place of the carbo-hydrates when they are deficient. The albu-

minoids indeed contain about 10 per cent. more carbon than starch and sugar do ; and although it does not all go to furnish heat in the body, yet it plays a very important part in its production.

In experiments made by Dr. Frankland, it was found that one pound of the nitrogenous elements of food, in contact with oxygen (that is, undergoing oxidation), liberates an amount of heat corresponding to—

	Tons raised one foot high.
Albumen	2,643.

One-seventh must be deducted from this number, because a small portion of the carbon and hydrogen is carried away in the body to form *urea,* which is excreted from the kidneys, etc. Thus, instead of 2,643 tons raised one foot high, the corrected numbers would be 2,266 tons.

By several experiments performed by the same scientist, it was found that the different carbo-hydrates produced the following results :—

	Tons raised one foot high.
Starch (arrow-root)	2,427
Cane sugar	2,077
Grape sugar	2,033
Oil (cod-liver)	5,649

It has been calculated that about one-fifth of the numbers given above would correspond to the combustion *within the body* of one pound of each of the substances named.

It must not be forgotten that the carbon and hydrogen contained in the different foods are gradually converted in the body into carbonic acid gas and water. This takes

place after the food has been digested in the stomach, and assimilated into the blood current during its transit through the intestines. The carbon and hydrogen come into contact with the oxygen, which has been carried to all parts of the body by the blood from the lungs. It is in the muscular tissues that the combustion or oxidation principally takes place. Thus force and energy are stored up in the form of heat (the blood temperature is about 98° Fahr.), and mechanical motion is evolved. The combustion is a slow one, but is always taking place. The food taken into our bodies has therefore to serve a twofold purpose, that of building up waste tissue, and that of combining with oxygen to keep up the heat, force, and energy of the body. The waste matter of the system, similar to the ashes and cinders in the locomotive, is represented by the carbonic acid gas, water, and urea, which leave the body through the lungs, the skin, and the kidneys.

It was considered for a long time, and by the world of science in general, that Alcohol was a source of heat and energy in the body, just as any other carbonaceous food. This theory was originated and propounded by the great Liebig himself, who classed beers, wines, and spirits, and all drinks containing Alcohol, amongst the respiratory foods. He said "Alcohol occupies a foremost rank in the respiratory or heat-giving foods. The ingestion of Alcohol dispenses with the use of farinaceous and saccharine foods." This view was unchallenged for some time, because after repeated experiments upon the lower animals by different men of science, Alcohol was not found in the blood or tissues either after ingestion into the stomach or injection into the veins. Therefore it

was considered very probable that Alcohol was oxidized in the tissues just in the same way as other carbonaceous compounds, and that heat was the consequent result. M. Duchek performed several experiments by which he concluded that Alcohol, when it entered the blood stream, was broken up into other elements, of which aldehyde was one, and acetic acid another. In order to prove this conclusion he introduced aldehyde (C_2H_4O, two atoms of hydrogen less than Alcohol) into the digestive canal, and found that it produced exactly the same kind of intoxication as that brought about by Alcohol. He also found that aldehyde was transformed after a time into the acetates and oxalates as a result of its further oxidation. Thus he came to the conclusion that Alcohol itself was first of all transformed into aldehyde, and then by further oxidation in the tissues into the acetates and oxalates, and eventually into carbonic acid gas and water. Thus the theory of Alcohol being a respiratory food was considered a proved fact for some time. In support of this theory it was acknowledged by every one that a feeling of warmth was experienced after a dose of Alcohol had been taken, and how could this sensation be produced if heat were not evolved ?

For some time this theory was accepted by scientific men, until a blow was given to it by three French scientists, who published a work in 1860 on the rôle that Alcohol and other anæsthetics played in the organism.[1] These gentlemen conducted a series of very interesting experiments, by which they proved that Alcohol remained un-

[1] "Du Rôle de l'Alcool et des Anesthésiques dans l'Organisme." Par Messrs. Lallemand, Perrin, et Duroy.

changed in the system, was not broken up into any other elements except a minute amount of acetic acid found in the stomach (supposed to be due to the action of the gastric juice upon the spirit), and that it left the body unchanged in the renal secretion, from the lungs, and skin. In the variety and number of the experiments performed by Messrs. Lallemand, Perrin, and Duroy, it was found that Alcohol in its unchanged condition had a particular affinity for the liver and nervous system, where it gradually accumulated. As the respirations betray the smell of Alcohol, it was supposed that a small amount of it left the body through the lungs. This was discovered to be the case, although the amount obtained was very minute, owing to a part of the alcoholic vapour escaping condensation during the course of the experiments. These gentlemen also failed to find any of the products of the oxidation of Alcohol, such as aldehyde, acetic acid, and oxalic acid, as demonstrated by M. Duchek and others. They also advanced the reasonable suggestion that if, after the ingestion of a large quantity of Alcohol, it was destroyed rapidly and transformed into carbonic acid, would not this agent destroy life by accumulation in the blood, and also be exhaled from the lungs more freely than in the normal state? It has been found, on the contrary, that Alcohol lessens the secretion of carbonic acid from the lungs; and that when death occurs from intoxication, it is not due to an accumulation of this gas in the blood, but to the influence of the spirit upon the nervous system. These experiments also went on to prove that not only does Alcohol remain unchanged in the organism, but that nearly all of it ingested is eliminated from the lungs, skin, or kidneys, after a longer or

shorter period. They did not promise to reproduce in its primitive state, and to the exact weight, the ingested Alcohol, but as near as possible they brought their experiments to this result.

The conclusions arrived at by Messrs. Lallemand, Perrin, and Duroy dealt a blow at the hitherto conceived notion that Alcohol, by becoming transformed by successive oxidations into carbonic acid and water, was necessarily a heat-productive compound like starch or sugar. Liebig had said, "Of all the respiratory foods, Alcohol is the one which acts the most promptly." He made this statement because it is well known by physiologists that starches and fats have to undergo certain changes in the system before they can enter the blood stream and be utilised there. Alcohol as a liquid would enter the circulatory system almost immediately after ingestion. The experiments of the three French scientists also went to prove that, if Alcohol were a food, it behaved quite differently from other foods which are introduced into the body. In a state of health, however large the quantity of sugar and starch that we eat, these substances are not found as sugar and starch in any of the secretions. They either undergo transformation into other products in the system, or are completely destroyed by combustion. With Alcohol they found a contrary state of things, and even Liebig was obliged to admit, after his support of the food theory, that "brandy, *by its action upon the nerves*, permits a workman who cannot procure for himself the quantity of food necessary for his existence, to repair, *at the expense of his body*, the strength which he requires; to employ to-day the strength which, in the natural order of things, ought only to be used to-morrow.

He consumes his capital instead of its interests; from which follows inevitably the bankruptcy of his body."[1] With such a statement as the foregoing, made by this eminent chemist, one wonders how he can have fallen into the error of supposing that Alcohol could act as food. Such a statement could not be made of the flesh-forming (proteid) or heat-producing foods. Neither albumen in any of its forms, nor sugar, nor starch, inevitably brings bankruptcy on the body. One does not consume one's capital of health in partaking of these foods, neither does one repair at the expense of the body the strength which is wanted. They have none of these harmful effects; (even taken in excess, they are only productive of benefit to the economy) thus from the point of view of utility as a heat-productive food Alcohol can bear no comparison whatever with them, since in large doses its action is decidedly harmful, even dangerous, and in small doses it is unsafe and unreliable.

For some time the conclusions of Messrs. Lallemand, Perrin, and Duroy, as to the disposal of Alcohol in the organism were accepted as final, until the researches of Dr. Parkes, Dr. Anstie, Dr. Thudichum, and Dr. Dupré brought more light upon the subject through their practical experiments. They agreed with the French scientists that a small part of the Alcohol ingested was eliminated with the different secretions. But they could not account for the whole of the Alcohol in that way. Drs. Anstie and Dupré discovered by means of the same test used by Messrs. Lallemand, etc. (called the bichromate test. It is a solution of bichromate of potash with

[1] "Familiar Letters on Chemistry." Liebig, 1859.

dilute sulphuric acid, and when Alcohol is added to this solution the colour from a dark brown becomes a bright emerald green), that the secretions of a total abstainer will often affect the test in the same manner as when a large quantity of Alcohol has been imbibed. Such being the case, it was considered probable that either in the natural state the tissues themselves manufactured a small amount of Alcohol, or that some other oxidizable product of Alcohol gave the same reaction. It seems to have been proved to the satisfaction of Dr. Anstie that only a very minute proportion of ingested Alcohol is given out by the secretions. In one experiment that he carried on he gave 2,000 grains of absolute Alcohol to a dog during ten days, and was only able to extract 1·13 grains on the last day from all the channels of elimination. In another case he administered 95 grains of Alcohol to a dog, and then had it killed painlessly within two hours afterwards. He carefully analysed all the tissues and secretions, and could not discover but 28·66 grains of the spirit.

Now, according to the French scientists, Alcohol can be discovered in the secretions from nine to twenty-four hours after ingestion, sometimes even during several days after a large quantity has been taken; therefore it is possible that if the subjects of the above experiments had been kept for some time longer, and their secretions examined at intervals, a larger quantity of Alcohol would have been obtained through the different secretions, and, if killed, in the various tissues, structures, and fluids of the body. And, again, it must not be forgotten that Alcohol has a strong affinity for water, and when it comes into contact with that fluid, either inside or outside the body,

it readily grasps hold of it, and mixes with it. Thus it may get stored up in combination with water in the secretions of the body until eliminated by the different channels. The difficulty of experiment and proof is very great, and one cannot doubt but that the question is still involved in a good deal of mystery, and that the final word with regard to the disposal of Alcohol in the organism has not yet been spoken. Dr. B. W. Richardson very clearly proved by his researches conducted during several years, between 1860 and 1870, that Alcohol did not generate heat in the system; that, on the contrary, the temperature was lowered in proportion to the quantity ingested; and therefore it could not be looked upon as a force-producer like the hydro-carbons (fats, oils, etc.) and the carbo-hydrates (starch, sugar, etc.). He also found that there was a marked reduction in the amount of carbonic acid given off by the lungs, so much so that life could be endangered in proportion to this reduction. Dr. Richardson summed up the result of his experiments in the following words:—

"Firstly, I believe there is a certain determinable degree of saturation of the blood with Alcohol, within which degree all the Alcohol is disposed of by its decomposition. Beyond that degree the oxidation is arrested, and then there is an accumulation of Alcohol, with voidance of it, in the unchanged state, in the secretions.

"Secondly, the change or decomposition of the Alcohol in its course through the minute circulation, in which it is transformed, is not into carbonic acid and water, as though it were burned, but into a new soluble, chemical substance, probably aldehyde, which returns by the veins into the great channels of the circulation.

"Thirdly, I think I have made out that there is an outlet for the Alcohol, or for the fluid product of its decomposition, into the alimentary canal, through the secretion of the liver. Thrown into the canal, it is, I believe, subjected there to further oxidation,—is, in fact, oxidized by a process of fermentation attended with the active development of gaseous substances. From this surface the oxidized product is in turn re-absorbed in great part and carried into the circulation, and is disposed of by combination with bases or by further oxidation."

All the eminent scientists quoted above are agreed upon several points. They disclaim Alcohol as a respiratory food possessing the same functions as starch, sugar, fats, oils, etc. They acknowledge that it has a peculiar affinity for water and nerve tissue, and that it is found stored up in the brain, and other parts of the nervous system, in the liver and in the blood. They nearly all draw the conclusion that whether Alcohol remains unchanged in the system or is decomposed, whether it is removed in part or in whole through the various channels of elimination, it neither acts as a flesh-producing food nor a force-producing food, that it is only a temporary stimulant in small doses, a dangerous narcotic in large ones. They admit that it produces grave disorders, creates an appetite for itself amounting in some instances to absolute craving, and has a tendency to be transmitted in the form of disease from generation to generation. Even supposing that future researches should impugn the accuracy of the brilliant experiments carried on by Messrs. Lallemand, Perrin, and Duroy, which led them to the conclusion that Alcohol was not

broken up in the system, and that it was all eliminated gradually, yet that scarcely alters the fact of the harmful effects produced by the frequent indulgence of Alcohol as a beverage. Whether it is as Alcohol the effects are produced, or as aldehyde, or in the form of the further processes of oxidation, I think matters little to the general public. The point is an interesting one scientifically, and will be of value, as such, to the medical profession; but it will scarcely alter the facts we know concerning Alcohol. There is one point in the total elimination argument which is scarcely compatible with the conclusions of the French scientists and others who hold their view. If all the Alcohol ingested is gradually eliminated from the system sooner or later, how is it that the tissues undergo the deleterious change which we know to be due to the action of Alcohol upon them? How is it the liver and kidneys become congested, enlarged, finally hardened and decreased in size, giving rise to serious forms of disease, which in the great majority of cases are incurable and end in death? How is it the nervous system and brain, the blood, the blood-vessels, the stomach, the lungs, may all become more or less affected by the continual use of this agent? Is it because the frequent use of Alcohol never allows time enough for the whole of its elimination? We know that drinkers scarcely ever permit more than three or four hours to elapse between each imbibition; thus it is very probable that the tissues become super-saturated with Alcohol, and the system is unable, through this constant dosage, to get rid of it by the different secretions.

Alcohol can be smelt in the expirations of a person who has recently been drinking spirituous liquors. There is

little doubt that during the circulation of the blood through the minute vessels of the lungs, some of the vapour of Alcohol is given out in this way. Experimentally it has been detected in the urine and perspiration from the skin. These are three modes of elimination which I think have been proved beyond doubt by the scientific observers before quoted, who, however, differ as to the *quantity* which is thrown off. On examination of an animal which has been killed after ingesting large quantities of spirit, the blood, liver, brain, nervons system, stomach, and bile have been fonnd to contain large quantities of Alcohol, not decomposed, not broken up into other compounds, but as Alcohol. Dr. James Kirk of Scotland, Dr. Agston of Aberdeen, Dr. Percy of Nottingham, Dr. B. W. Richardson of London, have all had opportunities of proving the existence of Alcohol in the brains of men who died from the effects of intoxication. The brain tissue in some instances smelt strongly of the spirit that had been taken, such as whisky; and a fluid found in the lateral ventricles gave the characteristic blue flame when a light was applied to it.

There is a reduction in the amount of carbonic acid excreted from the lungs when Alcohol is taken, also a lessening in the number of respirations. This is probably due to the absorption of a certain amount of the oxygen of the blood and tissues by Alcohol; but whatever the cause, the effect is to devitalize the whole body by the retention of poisonous matter (one of the waste products of the system) in the tissues and blood.

In the first period of excitement after Alcohol is taken, there is a slight rise in the temperature, after which, as the second stage supervenes, a decided fall. This de-

crease in the temperature varies in proportion to the amount taken, and very often causes fatal results.

Alcohol is no food. It does not contain the necessary element, nitrogen, to act as a flesh-forming food, and it does not by combustion in the tissues produce heat, and therefore energy. It does not supply the mineral matter required in the body, and it has a decidedly deleterious effect upon the water of the tissues.

All foods (respiratory and flesh-forming) are transformed in the system, and are not found in any of the secretions in their normal condition. They do not accumulate in any of the tissues of the system like Alcohol to effect deleterious changes.

Scientific men are agreed that, in the organism, Alcohol produces certain effects in proportion to the amount taken. Roughly speaking, there are three stages of intoxication: (1) the stage of excitement or exhilaration, when the blood-vessels are relaxed; (2) the loss of muscular power, beginning first in the lower extremities and then extending to the arms; (3) unconsciousness or coma, ending often in death.

The *exact* disposal of Alcohol in the organism is as yet a moot point, but sufficient is known about it to discard it at once as a beneficial agent, or as one which can serve any useful purpose in the economy.

Alcohol can only be regarded, then, as a food-adjunct or condiment. As Dr. F. R. Lees, of Edinburgh, aptly observes in one of his works, mustard and cayenne can produce *sensations* of heat; but no one would suppose that either of these agents generates heat or increases it. In the same way as mustard and cayenne inflame the tissues over which they pass, so does Alcohol; and in

neither case is heat produced or flesh formed in the body. Imagination plays a very important part in our beings, and I believe that in the case of Alcohol imagination has been the prime mover in exalting its claims as a necessary article of diet. Because the palate has become accustomed to its use, and certain sensations considered agreeable are the result of its use,—because the taste for Alcohol is hereditary, and total abstinence requires more will power than most people care to exercise,—Alcohol is therefore looked upon as a necessity of our existence, as an agent sent from above to comfort, soothe, and solace poor humanity in all its troubles, and to act as food, medicine, and drink all in one. Ignorance reigns supreme upon the subject, and therefore the superstitions concerning the action of Alcohol continue to flourish. Many people decline to accept the enlightenment even when it is put before them by every available means. There is a deep-seated obstinacy in the human character, especially when combined with intellectual ignorance, that absolutely refuses to be convinced by the most scientific of truths, the most logical and eloquent of arguments. Over this form of obstinacy, reason and science have no power whatever; the only hope is in the gradual spread of education amongst all people. Education alone can bring the mind into that malleable state which will investigate a new truth before rejecting it as unworthy of consideration. Obstinacy is one of the many children of ignorance; and until a nation has condemned ignorance, has determined that it shall no longer exist as a foe to progress, reform, and science, we cannot expect to get rid of obstinacy. Temperance reformers know very well what I mean when I refer to this peculiar trait of human

nature—the trait that in highly educated, enlightened, and refined minds becomes strength of will and earnestness of conviction, that in minds unlit by a ray of light means stubborn delight in ignorance, unalterable and sullen prejudice. Educated people know how to get uneasy under the attacks of science and knowledge; although they may cling to the habits they have learnt to love, and defy the dictates of wisdom, they will often frankly admit they are wrong, but are too weak to change. Ignorance opposes an armour of sullen resistance which requires endless shafts of patience and learning to penetrate, and then often fail in making any impression.

The next and succeeding generations will be better fitted, through the compulsory system of education which exists, to accept, digest, and profit from the teachings of science. The trick of learning in youth leaves the mind open; thus the power of reason and the desire for knowledge will gradually eradicate the cloven hoof of obstinacy, prejudice, and superstition from their strongholds. We want "light, more light," as Goethe said in his dying moments, on the subject of individual, and consequently of public health. Teach the people how to live healthily, what to eat, drink, and avoid, and a nation of strong men and women, mentally and physically, will eventually people this island, and will, small as that island is, ensure the respect and admiration of all mankind.

CHAPTER III.

MORTALITY AND DISEASES DUE TO ALCOHOL.

That Alcohol is one of the most powerful agents, directly and indirectly, in the production of acute and chronic diseases cannot be disputed for one instant by any one with the smallest knowledge of the subject. The ablest medical authorities we have amongst us, those who have seriously considered the responsibility of making rash, unguarded, or misleading statements, and who are devoting their lives to arriving at the truth about Alcohol, are of the same opinion on this matter. They declare that a large proportion of the disease and mortality of the United Kingdom is due to drink. When we consider for one moment the question impartially, we cannot but share the same view; indeed, to shut our minds to the truth of this matter when once it has been exposed to us, is an act of criminal folly or ignorant prejudice. Truth is for all of us, to guide us in our actions and to make life better and richer for each individual. Let us not, then, take pride in our ignorance, nourish our prejudices, and disdain knowledge; let us live to improve our understandings, to learn wisdom, and to arrive at truth.

In an address dealing with the action of Alcohol upon health, Sir Andrew Clark, senior physician to the London Hospital, made the following statement: "I do not

desire to make out a strong case, I desire to make out a *true* case. I am speaking solemnly and carefully in the presence of truth, and I tell you I am considerably within the mark when I say to you that, going the round of my hospital wards to-day, *seven* out of every *ten* cases there *owed their ill-health to Alcohol.* Now what does that mean? That out of every hundred patients which I have charge of at the London Hospital, 70 per cent. of them directly owe their ill-health to Alcohol—to the abuse. I do not say that 70 per cent. were drunkards, but to the excessive use. I do not know that one of them was a drunkard. . . . On the whole, it is not the drunkards that suffer so much from Alcohol. . . . No, the men to whom I allude are the men who are habitually taking a little too much . . . these are the men who, taking a little more than they require or can use, looking well—yea, often feeling well—are yet being sapped and undermined by this excess. Day by day—just as the grass grows, and you cannot see it—day by day this little excess—often a little one—is doing its work. It upsets the stomach, the stomach upsets the other organs, and bit by bit, under this fair and genial and jovial outside, the constitution is being sapped, and suddenly some fine day this hale, hearty man . . . tumbles down in a fit. That is the way in which Alcohol saps the constitution." Such are the strong, outspoken, fearless opinions of one of our most noted physicians, of one who has had a vast experience amongst all sorts and conditions of men, who has devoted his life to the amelioration of human suffering. The eminent teetotal physician, Dr. B. W. Richardson, who has given up the greater part of his life to the physiological and medical

aspect of the drink question, who has instituted original researches on the action of Alcohol upon the human system, and whose works ought to be in the hands of every student of medicine, says that "our national vitality would be increased one-third were we a temperate nation," and that it is "the duty of every physician to speak plainly on this subject, because it is his painful task, day by day, to treat the most terrible and fatal diseases, for the origin of which he can assign no other cause than the use of Alcohol;" and again, "In whatever way he turns his attention to determine the persistent effects of Alcohol, he sees nothing but disease and death—mental disease, mental death—physical disease, physical death," [1]—and we might add, moral disease and moral death.

The esteemed and honoured president of the Society for the study and cure of inebriety, Dr. Norman Kerr, has compiled a most useful pamphlet upon the rate of mortality from intemperance, in which he clearly proves that over 120,000 deaths are annually caused from Alcohol. So anxious is Dr. Kerr not to be accused of any exaggeration in the matter, that he rather understates than overstates the real facts of the case. It is almost impossible, with our present system of registration, to arrive at a true estimate of the mortality due to drink, as can very clearly be seen by comparing Sir Andrew Clark's statement with that of Dr. Norman Kerr. If seventy out of every hundred diseased persons owe their ill-health to Alcohol, this agent must eventually put an end to life itself, unless the diseased organ or structure

[1] "Diseases of Modern Life," p. 210. By Dr. B. W. Richardson.

is radically cured and the habit is abandoned for ever after. Unless the disease is only at its commencement, the medical profession admits that cure of an organ or tissue destroyed by Alcohol is quite beyond human skill. When once degenerative changes have taken place, such changes that completely destroy the structure and subvert the functions of an organ, nothing can be done; the work of the physician then lies in alleviating pain and prolonging life to the best of his ability. We will suppose that out of Sir Andrew Clark's seventy alcoholic cases, twenty are at the commencement of the disease, when there is a possibility of cure, and life is not altogether endangered. I think that this is subtracting a good proportion, one which is probably much beyond the mark. That leaves 50 per cent. of sufferers, who, if not accidentally killed, will lose their lives sooner or later by indulgence in Alcohol. Therefore it can be said, that directly and indirectly, intemperance causes half the mortality which takes place every year in our midst. Let us analyse still further. The number of deaths in the United Kingdom is about 680,000 annually; of these about 260,000 take place amongst children, who die below the age of five years. Now the latter we cannot suppose to die from the effects of drink, although, as I shall presently show, that mournful number is hastened out of life by the intemperance of others. Subtracting that number from the gross total, we have left 420,000 deaths from all causes between the ages of five and one hundred. Of these, according to my calculation, at least 210,000 are due to Alcohol, not counting the indirect infant mortality from this cause. In support of this conclusion I quote from Dr. Norman Kerr, who has

mathematically proved his position. He says: "(1) If all drinking, limited and unlimited, be taken into account, and if all our 16,000 practitioners had a similar experience to myself, the records of my own practice point to a minimum annual mortality, from Alcohol, of 200,000. (2) If the opinion expressed by Dr. Richardson, than whom we have no higher authority, that our national vitality would be increased one-third were we a temperate nation, be well founded, we lost in 1876, through Alcohol, 227,000 lives. (3) The death-rate in the general section of the United Kingdom Assurance Company, from which drunkards are excluded altogether, being fully seventeen per cent. higher than in the abstaining section, this ratio, applied to our whole number of deaths in Great Britain and Ireland, supposing we had no drunkards amongst us, gives a probable annual mortality from what Sir Henry Thompson calls "drinking far short of drunkenness" of more than 117,000. (4) A comparison between the returns for eight years of the Rechabites and the Odd-Fellows in the Bradford district shows a death-rate in the latter of one in forty-four, and in the former (total abstaining society) of one in 141. This applied to the whole kingdom, would indicate a loss of life through Alcohol every year of 227,000." These figures have never been seriously disputed, although the pamphlet appeared in June, 1879; and medical men, licensed victuallers and their friends, and the public generally, have had plenty of time to put the figures to a thorough and searching test. The fact is that the statement is indisputable, is rather below the mark than above it, and cannot be approached for investigation with anything like satisfaction by the lovers of Alcohol and

believers in its potent influence for good. One has only to consider the frightful mortality amongst publicans, brewers, and distillers to find that, in proportion to the ease with which Alcohol can be obtained, the death-rate increases. Dr. Ogle, the eminent statistician, supplies the introductory letter to the forty-fifth annual report of the Registrar-General of Births, Deaths, Marriages, in England from 1871 to 1880. In this letter, after enumerating the cause of death and the healthiest occupations, Dr. Ogle says: "In dealing with high figures, however, the first place is claimed by the trades which are concerned in the manufacture and distribution of intoxicating drink, and which, as is well known, entail many temptations to drink it to excess. The list of unhealthy occupations is headed by the class of inn and hotel servants, whose figure mounts up to 2,205. (The mortality is taken as 1,000, and the death-rate of the class under examination is compared with this as with a standard, some being beneath and others above it. For instance, ministers of religion only number 556, gardeners 559, farmers 631.) Their death-rate in the 25–45 period is 22·63 per 1,000, and in the 45–65 period 55·30, both being nearly double that of the medical profession (and four times that of clergymen). Inn-keepers, publicans, spirit, wine and beer dealers figure at 1,521; brewers at 1,361. In support of the belief that these high rates of mortality are chiefly due to alcoholic excess, Dr. Ogle has compared with them the mortality assigned to diseases of the liver, the organ through which such excess chiefly declares itself, and has obtained results which are entirely in harmony with those of the trade returns."[1]

[1] *The Times.* Tuesday, Nov. 10th, 1885.

In an address on the subject of the drink question, delivered by the well-known and earnest temperance advocate, Dr. Symes Thompson, he gave the following figures, which bear out Dr. Ogle's statistics : of one thousand deaths :—

Farmers,	12 per 1,000.	Bakers,	21 per 1,000.
Shoemakers,	15 „ „	Butchers,	23 „ „
Labourers,	17 „ „	Publicans,	28 „ „
Miners,	20 „ „	Brewers,	45 „ „

Employed in distilleries, 60 per 1,000.

The ideal death-rate is supposed to hover somewhere about 12 per 1,000 ; that is what philanthropists, physicians, and sanatarians are working for, and there is no reason why their efforts should not be crowned with success. But whilst we have the brewers, distillers, and publicans, with an average mortality between them of nearly 45 per 1,000, little progress towards this ideal can be expected, or will be possible. The trade is not a healthy one—is, indeed, diametrically opposed to the possession of the highest, or even to a high standard of health, and carries off more victims than such occupations as shoemaking, mining, baking, etc. And yet none of these trades are healthy, and no doubt there is a large amount of drink amongst the men who follow them which undermines their health. And, moreover, the publican is generally well off in other respects. He has plenty of ill-gotten gains by which he can nourish his body with food of the best kind, clothe himself well, live in a handsome residence, and put by money. In fact, a publican runs very little risk of failing in trade if he is not a spendthrift. In times of depression, when every other kind of business is suffering, when trade is more or less at a

standstill, the publican continues to flourish; the baker may have to put up the shutters, the publican never. He not only enjoys the necessaries of life, but oft-times revels in its luxuries, and yet his death-rate is 45 per 1,000. Surely then disease is working havoc amongst this class of men, the cause of which is directly traceable to Alcohol, by which they are ever surrounded, and the temptations of which they cannot escape.

Owing to our improved sanitary conditions, to the greater interest taken by the public and individuals in matters affecting health, and to the progress of medicine generally, which is now bent upon preventing disease, rather than curing what is oft-times incurable, the death-rate of England has been gradually decreasing the last fifty years. Sir Spencer Wells gives it as his opinion that the average duration of human life is about nineteen years longer than half a century ago; that whereas the average length of life was as low as thirty, it is now as high as forty-nine years. If this opinion can be relied upon, and there is no reason whatever to doubt it, when we keep a steady watch on the mortality returns of the Registrar-General, it shows what can be done by attention to the causes affecting health and life. It also shows what may be achieved during the next fifty years, if we are determined to approach the ideal death-rate. At the present time, the average death-rate for the United Kingdom is about 21·0 per 1,000, so that we are a long way off perfection, and have much to accomplish in the way of sanitary reforms and hygienic teaching. In the towns of Dublin and Preston, for instance, and many others of their characteristics, the death-rate returns during a week are often as high as 35 per 1,000. In London they often

subside to as low as 15 and 16 per 1,000 for the whole population. But in this vast city, the mortality of different parts should tell a very significant lesson to our doctors and legislators, to our philanthropists and Christian workers. Quite lately the Board of Works for Old St. Giles's parish (lying to the south of Upper Holborn and New Oxford Street), and the comparatively new parish of St. George's, Bloomsbury, has issued its annual report of the works discharged, including a report on the health of the population contained in the district. The death-rate of the whole district (when corrected by having the deaths of inhabitants out of the districts added, and the deaths of non-inhabitants within the district deducted) stood at 22·9 per 1,000 of the population, as compared with 19·9 for all London; but this was very unequally distributed, for while Bloomsbury has a *death-rate of only* 14·6, and the open part about Oxford Street and Holborn *showed a rate of* 18·5, the closer parts, such as Drury Lane and Great Wild Street, though greatly improved by the erection of labourers' dwellings, had a death-rate of 36·3—far more than double that of the other parts of the same district. In one particular part, the Shelton Street area, Dr. Lovett, the medical officer of health, says the death-rate during the past year was as *high as* 58·5 *per* 1,000 of the population. Surely such statistics should agitate the mind of every thoughtful person, and should compel him to seek out the causes of this enormous difference between two districts lying within a stone's throw of one another. The parish of Bloomsbury is comparatively wealthy and prosperous; it has large and open squares, and is mainly inhabited by the Jewish community, the members of which are cer-

tainly the healthiest, longest lived, and most sober of all races of men. Dr. B. W. Richardson refers to this subject in one of his works. He says: "These parts show that, from some cause or causes, this race presents an endurance against disease that does not belong to other portions of the civilized communities amongst which its members dwell. . . . The resistance dates from the first to the last periods of life. . . . The value of life is in favour of the Jews; the average duration of the life of the Jew being forty-eight years and nine months, and of the Christian (these are German and not English statistics) thirty-six years and eleven months. In the total of all ages, half of the Jews born reach the age of fifty-three years and one month, whilst half the Christians born attain the age of thirty-six years only." Dr. Richardson, in explanation of this superior vitality amongst the Jews, says: "The causes are simply summed up in the term, 'soberness of life.' The Jew drinks less than his 'even Christian'; he takes, as a rule, better food; he marries earlier; he rears the children he has brought into the world with greater personal care; he tends the aged more thoughtfully; he takes better care of his poor, and he takes better care of himself. He does not boast of to-morrow, but he provides for it, and he holds tenaciously to all he gets." Here, then, is a part of the secret of the lower death-rate amongst the inhabitants of Bloomsbury than those of St. Giles. In one there is a prosperous, careful, and healthy community; in the other, poverty, thriftlessness, bad feeding, over-crowding, intemperance, and a multitude of other horrors reign supreme. The birth-rate, singularly enough, seems to be in proportion to the death-rate: high birth-rate, high

death-rate; low birth-rate, low death-rate. In the poorer and more crowded parts, the birth-rate was as high as 43·5 and 36·3 per 1,000 (far above the average for the whole of London); whilst in the richer quarters of the same district, the birth-rate was only 21·9 and 19·7 per 1,000 of the population. Such figures tell a significant story to thoughtful minds, and point a stupendous moral to the social and sanitary reformer. To overlook them, to ignore them, to treat them with indifference, is akin to culpable selfishness, if not to downright heartlessness. Those who have the interests of mankind at heart, those who are living and working for the amelioration of human suffering, those who are wanting to leave the world better than when they entered it, those whose hearts are wrung by the cry of the helpless little children, those who are real Christians, and would live up to their faith,—to such this awful difference between the rich and poor must burn in their brains, and awaken their consciences, and give them no peace, till the whole of civilized society, every individual adult member of it, is determined to face the cause unflinchingly, and apply the remedies which are called for.

When an earthquake passes over the land, we are not responsible for the destruction of human life resulting therefrom; when a storm arises at sea, and shipwrecks occur, and life is lost, we look upon it as one of the unhappy accidents which may befall any one of us who travel, and we do not feel ourselves blameworthy; but when an epidemic of small-pox, diphtheria, scarlet fever, typhoid, cholera, or any of the other contagious diseases, suddenly bursts forth, and carries off its hundreds, a twinge of guilt runs through the conscience of the com-

munity, and the papers and journals are full of learned articles on the subject. The medical profession, the legislature, the sanitary authorities,—in fact, the whole of society, more or less, feel themselves responsible for the outbreak, and what is more, are responsible for it. So strong, indeed, has been this sentiment of responsibility in the civilized and humanitarian society of the nineteenth century, that it has succeeded in raising the average duration of life, in stamping out some of the epidemics,[1] and modifying the severity of others, and in materially reducing the death-rate, by attention to the laws of sanitation, ventilation, and a general hygiene. The feeling of responsibility once aroused can never again become dulled and inert; the selfish and indifferent may endeavour to stifle it, may succeed in killing its primitive germs in their nature; but as long as knowledge exists, and as education becomes more diffused, so long will the feeling continue to flourish, to grow in strength, and make progress in practical directions.

But epidemics we see, they come amongst us suddenly, they seize hold of thousands of victims, they precipitate them into the grave almost before assistance can be procured, they create universal alarm. The cause has been probably working away to produce the epidemic for some time without being noticed. Bad drainage, impure water, foul air, over-crowding in a state of dirt and filth, are potent causes of the epidemic in nine cases out of ten. The authorities are roused up to action, inquiries are instituted, investigations are made, and a thorough

[1] Vide the plague, the black death, ague, etc., which no longer exist among us.

overhauling of the insanitary condition results, thus we battle with epidemics, and reduce their severity and frequency. There are many unacknowledged agents of disease and death in our midst, working just as much havoc, only in a slower and more insidious way, as bad drainage and impure water, etc. Putting all the epidemics together, and counting up the number of deaths caused by them during the year, the sum total is not by any means so great as that resulting from intemperance. Moreover, a person attacked by an epidemic may completely recover, and his constitution is not necessarily damaged by the disease. But the effects of Alcohol are insidious, gradual, for a long time indeterminate, but too often fatal. If, as Dr. Kerr has so ably proved, over 220,000 persons lose their lives yearly through Alcohol, then we have an agent which causes 33 per cent. of the total number of deaths. An enormous and awful percentage, and one which is the more heart-rending because it is preventible. But Sir Andrew Clark says that 70 per cent. of the disease is caused by Alcohol, therefore 33 per cent. of the mortality caused by this agent is far below the estimate, and I should be inclined to think that 50 per cent. of the deaths due to Alcohol would be nearer the mark.[1]

[1] Sir William Gull says: "Short of drunkenness, I should say from my experience that Alcohol is the most destructive agent we are aware of in this country."—"Advantages and Disadvantages of Alcohol."

Dr. Charles Murchison, F.R.S., etc., says: "My experience has led me to the conclusion that Alcohol, taken in what is usually regarded as moderation, is more or less directly the cause of a large number of the ailments which in this country render life miserable, and bring it to an early close."—"The Utility of Alcohol in Health and Disease."

The truth of it is that an accurate statement with regard to this important aspect of the temperance question is very difficult to obtain. It can easily be seen that a person may die directly from the effects of drink, and yet the death certificate would tell no story to the casual observer, or even to the unmedical persons who compile the mortality statistics. Heart disease, acute pneumonia, kidney disease, dropsy, cirrhosis of the liver, apoplexy, paralysis, phthisis, gout and many others, may be recorded as the cause of death, and the statement would be perfectly correct so far as it went; but who would see Alcohol written in letters of fire underlying these diseases as the direct cause of death? How can we expect that the uninitiated observer shall know that Alcohol is a potent cause of heart disease, liver disease, and kidney degeneration? In all those cases where the attending physician knows for a certainty that Alcohol is the direct cause of the disease which ends fatally, it would be possible to record it on the death certificate, with the name of the disease resulting therefrom. By this means we might arrive at the truth. But there are the feelings of the relatives which must be taken into consideration, for naturally they would be very much hurt at the idea that the failing of one they loved should become public property. In order to overcome this difficulty, Dr. Kerr has suggested that a private intimation of the fact should be made by the doctor to the authorities.

Whatever plan should be ultimately adopted, it must be admitted by every sensible person that something must be done to arrive at the absolute truth about this matter. The compulsory notification of disease, and the correct cause of death in all cases, should be, I think, a

proper matter for the interference of the State, because we might in this way, by sifting the causes of disease and death, more effectually and quickly establish and point out the remedies. The Registrar-General's reports of births, marriages, and deaths have only been issued during the last fifty years or thereabouts, and they have, during that time, done much to enlighten the community on the question of its general well-being. The study of the mortality statistics constitutes a liberal education even more than the conversation of a young and clever woman, with all due deference to Dean Swift; and if the State were to push its inquiries a little further, our enlightenment would be still more thorough, and might lead to splendid practical results.

Our infant mortality is a shocking blot upon our civilization, and one which should arouse every fibre of humanity within us. For the year 1876 the deaths in England numbered 500,000. Nearly half of these deaths occurred in children under the age of five years, and more than half of these deaths—that is over 100,000—infants under the age of one year. Only one-third of all the children born reached the age of five, more than one-sixth never see the end of their first year. Now what are the causes of this sickening mortality amongst these poor little miserable waifs and strays of humanity? Are mothers without hearts, fathers without consciences, governments without thought for the welfare of the young, that infants and young children should be allowed to die like rats? Where is the use of our civilization when such a slaughter of the innocents is possible in these so-called enlightened days? Are human beings wilfully blind and deaf and dumb, or is it the

darkness of ignorance which encompasses them? Are not the medical profession and the Church aware of these facts, that they do not make them ring through the land from the pulpit and the press? Surely the cries of these poor little suffering, neglected, and diseased creatures should pierce the armour of indifference, and awaken a response in tender breasts! There is a Walter Besant to espouse the cause of miserable women worked to starvation and death by the brutal sweating system; surely there should rise up a man or woman to espouse the cause of the slaughtered little ones! It is time that the question of the infant mortality of our country should be investigated, for nearly all its causes are preventible. But by far and away the principal cause is drink. Directly and indirectly Alcohol is at the bottom of this hideous mortality among the young, and investigation into the matter should be conducted by those in authority. Indeed, the whole of the community should make it its business to force on such an inquiry, so that the true facts of the case may be brought into the light of day and the proper remedies supplied.

Dr. Norman Kerr thinks that of the 260,000 deaths occurring amongst children below the age of five years, 65,000 are directly or indirectly due to intemperance. He says: "Some may be disposed to question the fairness of the apportioning 65,000 infantile deaths to intemperance. More than one-third of all the infants I have seen die have died prematurely from some one's intemperance, and sometimes, for many cases in continuous succession, not one would probably have happened during the period of infancy had the parents or guardians not given way to drink." When one studies the statements made by those

who are in a position to judge of this question, there can be no doubt whatever that Alcohol is again the sinner. Dr. A. W. Edis says "that the premature deaths of the 130,000 children dying in England in 1876 before attaining the age of one year, were due in great measure to the ignorance of mothers in giving wrong food, and to the pernicious delusion of nursing mothers that they require to be kept up by alcoholic liquors."[1] Insufficient food, improper food, scanty clothing, neglect, soothing syrups, and spoonsful of gin and brandy in the feeding bottle to quiet the fretful cries of the little ones, are potent causes of disease in the young and sensitive frame. But why are the children neglected and ill-fed and badly clothed? Because the mother or father, or both, are spending their earnings at the public-house, and are in the meanwhile depriving their little ones of the necessaries of life. This is one of the many indirect causes of infant mortality due to intemperance. Amongst others may be mentioned the diseases that young children contract from the cruelty and neglect of drunken parents, when their poor little frames are subjected to treatment of the most atrocious kind—such treatment that has made the formation of a Society for the protection of children an imperative necessity in this civilized country. In time the worn-out, sensitive frames succumb to the inevitable end—death. The overlaying of infants by drunken mothers is one of the most sickening of this sad list of indirect and preventible causes. "In Liverpool alone, in 1872, 165 infants were suffocated mainly

[1] "The Mortality from Intemperance," p. 10. Dr. Norman Kerr.

by drunken mothers. In one day, Dr. Lankester held seven inquests on children smothered through the drunkenness of the mothers. At an inquest held in March, 1876, the deputy coroner for Middlesex remarked that in that district alone, 300 children were suffocated annually in bed, seven-tenths of the cases occurring on Sunday mornings, and that such cases might be explained as the outcome of parental over-indulgence in drink on the Saturday night."[1] There is not a coroner or a parish doctor who cannot corroborate these painful facts from his own experience. Dr. Harrison Branthwaite, F.R.C.S., medical officer for Willesden, in his first annual report of the sanitary condition of that suburb for the year 1882, remarks upon the frequency with which cases of infantile mortality came before him, and upon their alarming increase. He gives it as his opinion that "the pernicious habit of drinking large quantities of ale or stout by nursing mothers, under the idea that they thereby increase and improve the secretion of milk, whereas they are in reality deteriorating the quality of that upon which the infant must depend for health and life, is one of the most potent causes of this mortality." Every doctor knows that the habit amongst nursing mothers is not only a widespread one, but one which has the sanction of time, prejudice, and custom to back it up. Dr. Borlase Hicks also gives it as his opinion that a large proportion of infantile mortality, especially that which takes place under the age of one year, is due to the alcoholic habit of nursing mothers, the Alcohol through the milk affecting the nervous

[1] Dr. Norman Kerr.

system of the child. He says: "The nervous system of an infant is much more sensitive and susceptible to injury and inflammatory action than that of an adult. If, therefore, an infant's brain be irritated by such diffusible stimulant as Alcohol being in the blood, it is certainly not to be wondered at that disorder or disease of the nervous system should ensue." [1]

Infantile mortality from intemperance is often due to the direct administration of Alcohol, it sometimes being added by ignorant mothers and nurses to the milk of hand-fed infants in order to still their cries and procure sleep. Inherited disease from intemperate parents is also a cause of early death amongst infants, the debilitated frames being unable to fight their way successfully in life, and succumbing to attacks which healthy children would easily repulse. The alcoholized milk of nursing mothers is undoubtedly a cause of disease and early death. Dr. Edmunds, a perfectly reliable authority on this branch of the subject, after giving it long and earnest study, says: "Some infants are never sober from the moment they are born until they are weaned." The tender, sensitive young organisms are perfectly unable to throw off the effects of this strong and inflammatory poison, and are often ushered out of the world in convulsions, or with infantile diarrhœa, colic, or disordered and enfeebled digestion.

Apart from the question of infantile mortality due to parental intemperance, a startling amount of disease and ill-health amongst children owes its origin to this cause. Healthy parents can alone breed truly healthy organisms,

[1] "Alcohol in Health and Disease." Dr. Borlase Hicks.

and therefore the responsibility of parentage is a very serious one, and one which is recklessly overlooked in this country of individual liberty. Amongst the poorer classes, early marriages on miserably insufficient means are the rule and not the exception, and the consequence is that young mothers bring one child after another quickly into the world, whilst their frames are weakened from want of rest and wholesome nourishment. No small wonder that the infants are undersized, pale, puny, and weakly. It is amongst such mothers that the stout and porter habits hold despotic sway, for it would be considered impossible to nurse the infants without these artificial aids. The simplest laws of hygiene are absolutely unknown to these girl-mothers of the poorer classes, and consequently half the children born amongst them die before attaining the age of five years, hurried out of the world by mismanagement, ignorance, and alcoholic indulgence. The taste and love for Alcohol are transmitted from parents to children as markedly as any other hereditary characteristic, habit, quality, or defect. Alcoholism, or any disease traceable to over-indulgence in Alcohol by the parents, may be as surely transmitted from one generation to another as any hereditary disease like consumption, cancer, gout, rheumatism, heart disease, or scrofula, etc. The inexorable law of nature by which the children suffer for the faults or profit by the wisdom of their parents is painfully apparent in the question of hereditary alcoholism, and what is stranger still, is that the alcoholic diathesis often skips one generation and reappears with added strength in the next, taking a different form of the disease as well.

In support of the statements made above, I could not

do better than give the experiences of three well-known physicians on the subject of alcoholism in childhood and youth, communicated to the British Medical Association sitting in 1884. Dr. T. M. Madden, physician to the Hospital for Sick Children, Dublin, testified that many such cases (alcoholism amongst children) came under his notice. "He gave particulars of a case of marked delirium tremens in a boy aged eight. His mother was a drunkard, and he, at the age of six, on discovering a secreted bottle of whisky, showed the hereditary tendency to follow her example. Before admission into the hospital with delirium tremens, he had obtained access to a bottle of port wine and almost emptied it. He nearly died from coma, and delirium tremens supervening, he was taken to the hospital. Boils followed, and he remained weak in body and mind for nearly a month. He was then sent to a reformatory and recovered. A second case of juvenile alcoholism, in a news-boy aged eight, was the son of a drunken mother. He was sent for his mother's whisky, and was rewarded with a sip."

"Dr. Barlow, of London, followed with some powerful facts as to infantile alcoholism, gathered from his experience in the Children's Hospital, Great Ormond Street. He had seen the evil effects of small doses of gin given to babies at the breast for flatulence. He had also found it customary to give quite young children among the poorer classes a daily quantity of beer. He had seen two or three cases of well-marked typical cirrhosis (disease of the liver) with a little ascites (dropsy) from this cause. He detailed one very striking case—the child of an apparently healthy mother, able to suckle it, and in fair circumstances. From six months old the

child was given a tablespoonful of beer twice daily, and from nine months old, a teaspoonful of gin in as much water daily. The child died, and was found to have one of the most typical hob-nailed livers (cirrhosis) that Dr. Barlow had ever seen. Dr. B. O'Connor bore similar testimony." In comment upon these awful statements, the *Lancet* remarks: "These are appalling facts which give great force to the warning of Dr. Madden and Dr. Barlow as to the responsibility of prescribing Alcohol to children."[1]

In the same paper read by Dr. Moore Madden another case was given which ought to be reproduced here. "A more pitiable instance of the consequences of alcoholism was in the same institution, in the case of a little girl five and a half years old, brought in suffering from acute meningitis (inflammation of the membranes of the brain), the result of a savage blow on the head inflicted some time previously by her drunken mother. During her ravings in the course of the disease, and even during her convalescence, this poor child babbled repeatedly, and craved earnestly, in her own words, "for a drink of porter from the gallon." It was subsequently ascertained that from the time she could totter along with that vessel, she was sent out to the public-house every day by her mother for a can of porter, out of which she was accustomed to help herself to a little on each occassion." Dr. Madden, in remarking upon the several cases he enumerated in detail, says: "Cases such as those just referred to, which are but a few of the many instances of the same kind which have come under my

[1] *The Lancet*, Sept. 6th, 1884.

care in the Children's Hospital within the past few years, are proof that alcoholism demands greater consideration than it has received as a prolific cause of disease and death in childhood. In the majority of cases of juvenile alcoholism that have thus come under notice, this tendency appeared to have been inherited, and was most marked in those children whose mothers were confirmed inebriates. Some reference is therefore necessary in this connection to alcoholism in women,[1] as bearing in many ways on the diseases treated in hospitals for children, where the effects of inherited alcoholism are strikingly evinced by the moral and physical deterioration of the offspring of the drunken, and by their special tendencies to strumous, tuberculous, and other constitutional taints." Dr. Madden also added that "lengthened experience in hospital and private practice, at home and abroad, had amply confirmed his opinion, that it is physiologically wrong and morally unjustifiable to allow a healthy child to taste Alcohol in any form." [2]

In nearly all these deplorable cases of juvenile alcoholism, and disease due to Alcohol, the mothers appear to have been the principal sinners. It is a commonplace enough fact, and yet one the importance of which is not sufficiently recognised, that the child receives more from the mother physically than from the father. For nine months she carries it next her heart, nourishing it with her life-blood; for nine months after its birth she feeds it from her breast. As the fœtus and the infant

[1] Aristotle said, "A drunken mother brings forth children like unto herself."

[2] *Medical Temperance Journal*, vol. lxi. Oct., 1884.

are so intimately connected with and dependent upon the mother's vital resources, her health, habits, and general condition must naturally influence its physical welfare much more than those of the father. Disease, habits, character, and disposition, etc., can be, and are, transmitted from father to child; but during pregnancy and the first tender years of infancy the fœtus and child are dependent for their *physical* development and nourishment upon the mother. Thus, if the latter has bad and unwholesome habits, the child will be sure to suffer; and if she encourages prejudices in favour of ale, stout, and porter, it were far better, when the child is born, that it should be hand-fed than be nursed upon the alcoholized milk of its mother, although, unfortunately, the fœtus in the womb does not escape the pernicious influence of Alcohol upon its tissues.

The children of drunkards are neither born healthy nor have they the chance of becoming healthy. They are deteriorated physically, morally, and mentally. The diseases which become most marked in these extreme cases are those of the brain and nervous system, idiotcy,[1] imbecility, infantile paralysis, St. Vitus's dance, convulsions, meningitis, water on the brain, being amongst the most common forms. The more chronic diseases amongst children due to parental intemperance are anæmia, rickets, scrofula, eczema, hysteria, dyspepsia, and tuberculosis of the lungs or bowels. Such children

[1] "Dr. Howe, in his well-known Report of the State of Idiotey in Massaehusetts, states that the habits of one or both parents of 300 ehildren having been learned, 145 of these children, or nearly one-half, were found to be the progeny of habitual drunkards."—"The Heredity of Aleohol," Dr. Norman Kerr.

generally fall victims of every passing epidemic, and a marked characteristic is mental dulness (sometimes precocity which does not persist), often combined with excessive moral depravity. Dr. Lauder Brunton says with regard to this part of the medical aspect of temperance: "The morbid changes which occur in cases of hereditary alcoholic tendencies consist in inflammatory lesions of the nerve centres, which vary according to the age at which they occur in the fœtus, the child, or adult. During the fœtal condition, the changes are those of arrested development. The most complete is that where the brain is almost entirely absent, as in an encephalous infant, which is born without any brain. Another is that in which atrophy of the brain occurring during fœtal life or early childhood is partial instead of being complete, and affects only one-half of the organ. Such cases are generally accompanied by a deformity of the head, by epilepsy, and by hemiplegia (one-sided paralysis), with atrophy of the paralysed limbs. Sometimes the development of the whole brain is partially, instead of being completely, arrested, and the head is then very small; the individual is idiotic, and sometimes paralysed in the lower extremities also."[1]

Dr. Lauder Brunton, in the same article, introduces some valuable statistics from the experiences of Dr. Martin, who found that 60 out of 83 epileptic children and youths examined by him were the offspring of parents given to drink; and in 23, drunkenness was not ascertained. "In 60 families, to which the patients of

[1] "Stimulants and Narcotics." By Dr. Lauder Brunton: "Book of Health."

the first series belonged, the number of children had been 301; but out of those, 132 were dead at the time the observations were made. Out of the 169 surviving, there were 60 epileptics, 48 had had convulsions in early life, and only 64 could be considered as healthy. The 23 cases in the second series belonged to 23 families, having 106 children, of which 27 were dead. Of the 79 surviving, 23 were epileptic, 10 had convulsions in early life, and 46 appeared healthy; a great number of these children also were paralytic and badly made. Excess in alcoholic liquors may be reckoned one of the causes of infantile paralysis, but it is to epilepsy that it specially gives rise." We also read in the same article that "it is not only the children of people who get drunk that become drunkards, but the children of those who are addicted to chronic drinking without ever getting drunk. This unhappy tendency is sometimes continuous and sometimes intermittent, and frequently co-exists with vicious tendencies which render the unhappy heir to it an idle vagabond, incapable of living in society." Not only do the children of the drunkard and habitual drinker suffer from organic disease or functional derangement of some kind or other, but they also run a terrible risk of inheriting the drink crave itself. Very often this particular diathesis remains quiescent during the early years of life, but leaps into existence either at puberty or early manhood and womanhood. From the experiences of Dr. Madden, it is seen that even early childhood does not escape this form of alcoholism or inebriety. The sufferers from the craving for drink are no more to be condemned than if a disease like consumption had been inherited. Such inebriety has no more

relationship with habitual sotting, with eternal nippings, than a common cold has with tuberculosis. The nerve tissue in these cases is fundamentally diseased, has been so from the beginning of life, and the disorder manifests itself generally, between twenty and thirty, in a mania for Alcohol. These sufferers, of whom there are, alas! far too many in the world, are oft-times highly gifted and talented members of society, who have no love for Alcohol for itself, indeed often exhibit a loathing for it between the drink periods, but cannot resist the horrible and intense craving for the drug when the crisis occurs. There is no sight so pitiable, so heart-rending, so utterly despairing as that of a dipsomaniac who is not responsible for his own misdoings. He is a cruelly wronged victim, and as much to be pitied, and cared for, and looked after, as any consumptive who has inherited his weakened lungs from one of his parents. The most brilliant intellects, the most amiable dispositions, the most beautiful natures have been utterly ruined and demoralized by this terrible inheritance, and the health of more than one man of genius during this century has been shattered, and his life shortened, by an alcoholic diathesis affecting so disastrously his blood and nervous system.

The gravity of inherited alcoholic neurosis must never be overlooked, it is sufficiently important to warn the most moderate drinkers of the risk they are running with regard to their children, for it is not certain that nerve degeneration does not take place even in very moderate doses when the habit is a continuous one, extending over a number of years, as we see in a large majority of instances. Not unfrequently we find

that apparently sober parents will have a child, who, in adult age, develops the drink crave; if there has been no known intemperance in the near ancestors, it is difficult to account for this outburst, unless continuous moderate drinking is a sufficient cause of nerve and blood deterioration in the parents—a fact which I am inclined to believe. It is often asked why a more universal deterioration of the race does not take place, if Alcohol exercises such a physically evil influence over succeeding generations. It is because the progeny of drunkards and chronic hard drinkers (who are never actually seen in a condition of drunkenness) die completely out in three or four generations. The nervous instability is so great, that insanity, idiotcy, epilepsy, are transmitted to the offspring, rendering them totally unfit for marriage and reproduction.

Alcohol is a strangely hydra-headed monster, and its hereditary manifestations are widely different. It is on account of the eccentricities which it exhibits that the unscientific world is thrown off its guard. What connection, for instance, would there be to the unenlightened mind between epilepsy or scrofula in the child and intemperance in the parent? None whatever. A mere coincidence and nothing more. Probably the intemperate parent is of strong constitution, even fine and healthy-looking—the intemperance is a failing, a great failing; but how can it possibly affect the offspring, argue the uninitiated? A person develops asthma as he grows into manhood. Is it to be expected that he or his relatives will see the connection between his asthma and his parent's or grandparent's gout? And yet in the annals of medicine, and not at all an unfrequent occur-

rence, is the disease known as gouty asthma. The gout was originated in the constitution of the father, grandfather, or even great-grandfather, by the port-wine drinking customs of the time, probably was the direct cause of death, and was handed down in some other form, such as gouty asthma, to the children and grandchildren. Thus are the sins of the father handed down to the third and fourth generation.

Every human being is born with the tissue or organ of least resistance—the one which most readily succumbs to the accidents of life. In one the point of least resistance is the lungs, in another the stomach, in a third one the intestines, in a fourth the kidneys, in a fifth the nervous system, in a sixth the blood, and so on. It is the part of least resistance which Alcohol attacks in each one of us if we indulge in its use, and it is for this reason that it assumes different forms not only in the descendants of the intemperate, but in those who suffer directly from its use. If several people are subjected to the same adverse influences, such as exposure to the cold and damp, each one will feel its effects in a different way. One will suffer from congestion of the lungs, a second from inflammation of the bowels, a third from gastritis, a fourth from acute Bright's disease, a fifth from bronchitis, a sixth from rheumatic fever, etc. Two or three may be attacked with a similar complaint, because naturally there are not as many diseases as there are human beings, but even then there will be characteristic differences in each case. In all these instances the part of least resistance in the constitution of each individual has been attacked by exposure to the adverse influence, and it is the same with Alcohol.

According to the form in which this drug is taken, according to its quality and its amount, so the system is affected in different ways. Roughly speaking, the beer-drinkers develop an unhealthy amount of adipose tissue, and their blood becomes very much deteriorated, so much so, that an accident of any kind, where there are surface wounds, will be a very serious matter with them. The unhealthy blood cannot form healthy granulations, the wound is always breaking down, and an unhealthy kind of pus, which drains the system, is constantly forming. The gin-drinkers have their liver, kidneys, and lungs most affected, giving rise to cirrhosis of the first two organs, bronchitis and alcoholic phthisis of the lungs. Pure spirit-drinkers generally become very emaciated, suffer from constant dyspepsia, and the brain and nervous system are the first parts affected. Wine-drinkers suffer from the stomach and liver primarily, and, if they indulge very largely, degenerative changes take place in the blood, nervous tissues, and the skin. Absinthe and epilepsy in France are closely allied with regard to cause and effect. These are but rough generalizations of the effects on the system of the different beverages containing Alcohol, and may be interchangeable. When the drinks are fortified by the stronger Alcohols, such as the amylic, butylic, etc., the nervous system is very seriously attacked, and undergoes rapid deterioration. The descendants of parents who have been addicted to the use of such beverages as potato-brandy, Dutch hollands, etc., are still more enfeebled mentally and physically, and are rarely reared beyond childhood. The direct effects of such strong and unwholesome liquors are far more quickly manifested

in those who partake of them than in those who consume the pure Ethylic Alcohol.

The hereditary effects of Alcohol are manifold, subtle, and indeterminate. They may appear in early childhood, causing disease and early death, or remain dormant till puberty, when the physiological changes which occur at that period of bodily development will be attended with manifestations of hereditary disease. Not unfrequently adult age is reached before the alcoholic taint in one or other form of disease invades the system. This last is more usual amongst the upper classes, where the children, surrounded by the best care and attention during childhood and youth, generally kept from the taste of alcoholic liquors till they are grown up, are built up into some semblance of health and strength. But as the habit is indulged in, so the seeds of disease which have remained so long dormant in the system will flourish into existence, and fair young lives will be rudely cut off sooner or later. Owing to the better conditions which surround the more fortunate members of society, who can rely from their infancy upwards upon plenty of fresh air, daily exercise, regular habits, wholesome food, and proper clothing, life can be far more prolonged, and hereditary disease kept at bay, than with those who live in fœtid slums, and who never know where the next meal is to come from. Infant mortality from parental intemperance, and all its awful consequences, is far greater amongst the children of the poor than of the rich, owing to the accompanying conditions being so miserable and inadequate. A child may combat disease and keep it in abeyance for many years; may grow up into manhood or womanhood, and live comparatively useful,

enjoyable lives, so long as good nourishing food, fresh air, healthy homes, and abstinence from intoxicating liquors can be depended upon. But failing these conditions, the frame that is born weakened, and with the seeds of disease in it, will succumb to the inexorable law of nature sooner or later, and generally much sooner than later. It is only strict temperance, healthy surroundings, and freedom from the fearful struggle of day to day existence, which can prolong the lives of those who are born with the constitutional seeds of disease implanted by the intemperance of ancestors. These facts can never be too much insisted upon in the consideration of the treatment of cases where there is any inherited tendency to alcoholic disease.

The diseases directly produced upon the system by the moderate and immoderate consumption of alcoholic beverages are even more numerous than those which are the result of hereditary transmission. During early adult age Alcohol seems to be less potent in its influence for evil than later on in life—we might put the limit at thirty—when the natural processes become more sluggish. In youth the tissues and structures of the body are in a highly exuberant vital state; they are continually being destroyed and renewed, and their recuperative powers are extremely active. The minute microscopical cells of which the whole body is composed, and which have different characteristics as they belong to muscle, nerve, bone, or blood, etc., are the active structures which carry on the processes of decay and repair. The basis, the living matter of these cells, is protoplasm, and it is to the activity and vitality of this peculiar substance, the fundamental property of all animal and vegetable life,

that we owe the continuance of existence. When the working powers of cellular structure begin to wane, to become sluggish, life gradually ceases. During youth the cells are very active; they carry on the processes of oxidation within the tissues most energetically; they are ever labouring to rid the body of products which are deleterious, and provide the materials which are useful to it. They are rapidly destroyed, but as rapidly renewed. Many millions of the blood-cells are destroyed every minute, and an equal number take their place in order that the equilibrium between the different parts of the system should always be maintained. In healthy youth the activity of these ever-working cells can be depended upon, and thus many indiscretions both in eating and drinking are committed without *apparent* harm being effected; but a time comes when their vitality wanes, their activity ceases, and then the different tissues of the body become clogged with useless products and poisonous debris. Thus disease is gradually set up in the system. Sir Henry Thompson has pointed out, in his able articles on eating and drinking, the importance of limiting the appetite in every direction as age creeps on, because of the inability of the tissues to dispose of their waste material so quickly as in youth. It is upon cellular structure that Alcohol exercises its evil effects. It paralyses the activity of the cells; it prevents their growth; it retards their renewal; and it hardens their protoplasm.[1] Disease must be the result,

[1] Mr. Coryn says, in his excellent pamphlet on the "Moral and Physical Advantages of Total Abstinence": "What will be the influence of Alcohol upon these activities? Reduced to a condition of diminished vitality, the cell will consume less fuel,

and it will assume different forms according to the cell-structure of the organ or tissue that the Alcohol has previously attacked. That most able and painstaking physician, Dr. Ridge of Enfield, has conducted practical experiments upon the influence of Alcohol upon cell-life, which are of the utmost importance to the student of this question. He placed an equal quantity of mould into bottles of the same size, to which he added an equal quantity of water and alcohol of different strengths. He then sprinkled a similar number of seeds of cress over the surface, corked the bottles, and exposed them to the same conditions. He says: "It will be found that the growth of the cress is hindered in exact proportion to the strength of the Alcohol, and that, acting thus continuously, surprisingly minute quantities of Alcohol are able to effect it. Thus even one drop of Alcohol in 20,000 of water (over one quart) hinders its growth slightly, while one in 10,000, and lower dilutions, exert a very marked influence." Dr. Ridge adds a most powerful comment upon the action of Alcohol on protoplasmic cell-life, whether animal or vegetable (for the effect is exactly similar), which I cannot refrain from quoting. He says: "It is almost unanimously agreed that *alcoholic liquors should not be given to children.*

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require less food, excrete less urea, carbonic acid, and water; its temperature will fall and its movements be slower. Assimilating less food, it will have less tendency to the formation of new cells. The repair of its own waste of substance will be less perfect, and the new material, continually subject to the action of the narcotic, will continually degenerate, until finally it ceases to have any vital properties, and the cell becomes a mere shell, containing inert fat or a dry and withered fibre."

They are more sensitive to its nervine influence, and their bodies contain a larger proportion of young growing cells on which Alcohol has a greater influence. But growth does not cease with adolescence, the repair of tissues by cell-growth goes on throughout life. To whatever extent, therefore, Alcohol is injurious to the young cells of young people, it must be injurious to the young cells of older people; and I see in this, one cause of the degeneration of tissues to which Alcohol leads, and by which it exerts its hurtful influence on health and life. For tissues which are built up of cells affected by Alcohol are, to that extent, unsound; and when, in time to come, the body is exposed to the wear and tear and storms of life, it is they which first succumb. . . ."

The vital processes are less active after a certain age, and, for this reason alone, Alcohol should be eschewed, as it tends to diminish them still more. The cells are altered in their function and structure by this agent, and their gradual degeneration leads to development of disease in the different tissues. Unhealthy cells cannot breed healthy cells, and each succeeding generation of cells is less healthy, and less vital than the preceding one. When oxidation of the tissues is prevented by inactive cells, when the products of combustion are retained in the system instead of being eliminated, the blood is rendered very impure, and tends itself to become the seat of disease. Gout is an illustration of this fact. This painful malady is due to the retention in the blood of the urates and uric acid, which ought to be eliminated through the kidneys. Owing to cellular inactivity throughout the system, these products of combustion are retained in the tissues and blood, and the crisis then

occurs. Why the uric acid and urates should particularly choose the joints as their seat of mischief is not yet thoroughly understood; the fact that they do so, every gouty person can answer for. When gout spreads from the joints to the internal organs, death is imminent. Gout is essentially a disease which has been fostered and originated by alcoholic beverages—especially rich sweet wines like port and sherry—and high living. It is strongly hereditary, and the lives of many total abstainers are rendered burdensome with this blood taint which flows in their veins. It is also quite true that their abstemious and simple habits of eating and drinking tend to diminish the potency of the crises, and to prolong life. Dr. Garrod, in his treatise on Gout and Rheumatic Gout, is inclined to attribute the existence of the disease almost entirely to the use of fermented liquors, at any rate as the most powerful predisposing cause of it, and Dr. Lauder Brunton says: "Port wine more especially tends to produce gout; but other wines are not free from this tendency. In gouty subjects, or those who suffer from rheumatic gout, a single glass of port wine will often produce painful twinges, and a similar effect is not unfrequently noticed from hock."[1] The testimony of the whole medical profession would be against the use of wines by gouty subjects, although they might be at variance with regard to their uses in other cases.

One of the earliest signs of alcoholic disturbance from a very moderate indulgence in Alcohol is dyspepsia, which may assume different forms in different individuals.

[1] "Stimulants and Narcotics." Dr. Lauder Brunton.

The effect is very rarely assigned to the cause by the sufferers. One of the most widespread of modern diseases is indigestion in its various forms, and in the large majority of instances it is caused not only by the excessive, but by the moderate use of alcoholic liquors. A slight attack of indigestion through some indiscretion in diet, or irregularity of meals, may have been treated with Alcohol by the physician in attendance, and the habit once formed has been continued and never abandoned. Thus it is never known whether the original prescription effected its purpose of curing the indigestion or not. One would feel inclined to think that it certainly had not done so, since its use is considered necessary for the remainder of life. In this way alcoholic dyspepsia is slowly but surely set up, the stomach becomes languid and incapable of performing its work, and the changes which have already been referred to take place in its mucous membrane and muscular substance. It is strange that we find Alcohol prescribed as a universal panacea; whatever the disease and wherever situated, this drug is sure to be to the fore. Thus, whether the dyspepsia be due to over-acidity of the stomachic contents, to flatulence, to an insufficient amount of pepsin in the gastric juice, or to the gastric juice being too thick or too thin, too acid or not sufficiently acid, Alcohol is recommended to be taken. If the indigestion is caused from gaseous fermentation, or to high living and over-much eating, or to semi-starvation, caused by insufficient and improper food, Alcohol is still the drug, or the beverage *par excellence*. Thus the universal remedy is indulged in without a physician's prescription, because the afflicted individual pretty well

knows beforehand that Alcohol will be recommended in some shape or other. Therefore why trouble to consult a doctor, and pay a high fee for the same advice? Relief is obtained at first by the Alcohol because it dulls the sensibility of the nerves of the stomach to pain, but as time passes on a larger quantity has often to be taken to produce the same result, and thus alcoholic dyspepsia is added to the original complaint. The ailment or disease has not been cured by Alcohol, otherwise its use would have been discontinued on permanent benefit being experienced; and far too often a dormant taste for it has been developed, which may never subside, but with death. "The appetite grows upon what it feeds," has been truly said by our greatest poet; and these words have had their fulfilment again and again in the alcoholic habit. Sir William Roberts, in a lecture on Dietetics and Dyspepsia, says: "By far the most remarkable departure on the part of man in regard to his food, from the common ways of the animal world, is the practice he has acquired of using in large quantities certain articles of a stimulant and restorative character, of which the chief are alcoholic beverages and tea and coffee. . . . These articles are not themselves endowed with nutrient properties . . . they directly complicate the task of the digestive organs." Dr. C. R. Francis, ex-Professor of Medicine in the Medical College, Calcutta, in an article on Dyspepsia, says: "There is probably no disorder in which aid from Alcohol is more readily and eagerly sought than in this (dyspepsia), particularly in certain forms of it; and none, perhaps, in which the remedy proves so treacherous and destructive; causing, in the long run, an infinite amount of harm to the

stomach itself, and, in many cases, developing the tendency of ulterior disease."[1]

Unless it can be proved that dyspepsia is *radically cured* by the use of Alcohol, it seems to me not only a useless but a dangerous article to recommend, because even should it not arouse a craving for itself, it may intensify the evil for which it was prescribed. Its reckless prescription should be strongly condemned by the whole medical profession; and if a certain end is desired, a definite dose should be given, as in the case of any other poison, such as nux vomica, hydrocyanic acid, etc., and its effects carefully watched. If no relief seems to be obtained, it should be at once abandoned, and some other drug substituted. This is done in the prescription of all other poisonous drugs, and should be imitated in the case of Alcohol. In the dyspepsia caused by overeating and rich diet, very often combined with large quantities of Alcohol, the remedy is apparent to the most untutored individual, and yet a fashionable physician has to be on his guard how he attacks the cherished customs of his aristocratic patient. The habits must be modified, but are they to be altogether changed, and a severe regimen prescribed, a Spartan simplicity? A doctor must indeed be very courageous, and a patient more than extraordinarily pliable and reasonable, for the cause of the disease to be spoken about frankly, and its remedy applied unflinchingly. And yet the only effectual treatment of such cases is complete abandonment of the vicious habits which have led up to the dyspeptic condition. Spartan diet and total abstinence from Alcohol

[1] "Dyspepsia." *Medical Temperance Journal.* No. lx. July, 1884.

is the only prescription which will do any good; and even then the disease may have progressed so far, and the morbid changes become so fixed, that complete cure cannot be looked for, and symptoms only relieved.

For a long time health may appear not to be affected by the use of Alcohol; but as the years go by, the various physical manifestations present themselves. Slight weakening of the heart, palpitations and fluttering of that organ, accompanied by feeble circulation, irregular intermittent pulse, which at other times is hard like a whip-cord, with a sledge-hammer impulse. In some cases the heart is found with thinned walls and largely dilated cavities, holding far more blood than in the normal condition; in others, the ventricles are found enormously thickened (hypertrophied), the lining membrane, especially over the valves, studded with small growths of a calcareous nature, which tend to promote the formation of clots. This latter condition may be traced along the aorta, and is found at intervals throughout the arterial system. In enlargement and hypertrophy of the walls of the heart, the cavities are encroached upon and less blood is held in them than normally; thus a smaller amount of blood for the purification and nutrition of the system is thrown into the blood-vessels at each beat of the heart, and the whole organism suffers from a process of slow poisoning. Whether the walls of the heart be thinned, and the cavities dilated under the influence of Alcohol, or whether they be thickened, and the cavities contracted, disease results, health is seriously affected, and life is threatened. Bursting of the blood-vessels (apoplexy) is often the result of the hardened brittle condition of the arteries; and with extra exercise,

or an unusual emotion, the heart sends a larger amount of blood into the vessels which, no longer able to expand and contract as formerly, burst, and hæmorrhage takes place. If this occurs in the brain, the most frequent seat of apoplexy, unconsciousness results with one-sided paralysis (hemiplegia); if it occurs in the lungs, hæmoptysis results. All these degenerative changes of the heart and circulatory system are not only the effect of excessive hard drinking when a person is looked upon as an habitual drunkard, but are the result of what is looked upon as moderate drinking, and will generally be found in those in whom there is any natural or inherited weakness of the central organ and the blood-vessels.

Cirrhosis of the liver is one of the commonest diseases of continuous beer and spirit drinking, the pathology of which will be entered into in a subsequent chapter. It has received the popular name of gin-drinker's or hob-nailed liver, on account of its resemblance to the nails on a labourer's boot. The whole organ is hardened and much shrunken, and the liver substance protrudes in little rounded nodules between the shrunken fibres of the connective tissue. Necessarily the functions of the organ are completely subverted; and whilst the degenerative processes have been proceeding, health has been gradually declining. Biliousness, diarrhœa or constipation, and deep-seated pains have been complained of, and at last dropsy supervenes, owing to the serous contents of the blood being pressed out of the contracted portal vessels into the abdominal cavity.

Cirrhosis of the kidney may also occur in the same manner, accompanied by frontal headache, giddiness, dimness of sight, and general depression, weakness, and

fatigue after slight exertion. The general name for this condition is Bright's disease. Alcohol may also have produced fatty degeneration of the liver and kidneys, in which case the symptoms would be slightly different.

Inflammation of a nerve cord, or neuralgia, is a common result of alcoholic poisoning. Taken in sufficiently large quantities Alcohol will act as a narcotic and dull the sensibility of the nerve to pain, but it will not have removed the source of evil. Soon after the neuralgia will return with threefold intensity, and again the pain-killer will be resorted to, and each time in ever-increasing doses, to produce the narcotic effect. There is scarcely any disease or ailment which has been the source of so much female intoxication as neuralgia. And why? Because in nine cases out of ten toothache is called "neuralgia of the face and head," and a visit to the much-needed, but dreaded, dentist thus avoided. Decayed teeth are the source of nine-tenths of the face and head neuralgias, the tic-doloureux, and other nervous symptoms which are so common now-a-days; and if women, instead of resorting to a delusive and pernicious drug like Alcohol, which cannot possibly *cure* the source of irritation, were to pay an early visit to the dentist, they would preserve their health and probably save themselves from a terrible habit and a degrading future.

Obstinate vomiting and early morning sickness are signs of alcoholic poisoning, and may precede disorders of a very grave character. It is nature's mode of trying to effect a cure, to eliminate a noxious element from the system. They generally follow on a bout of drinking, and leave in their train a long series of ugly symptoms,

signs, and sensations. Yellow and blood-shot conjunctivæ, sallow complexion with a bilious tint, white furred tongue, tremulous hands, and indistinct utterance are observable in nearly all cases. The temper is irritable and gloomy, the susceptibilities morbid, the emotions dulled, and the brain-power blunted. Complete recovery may occur if the occasion is the first, second, or third, at long intervals between each; but when the bouts of drinking are frequent, chronic or acute dyspepsia sets in, and the sickness is often a characteristic sign of the habit.

Alcoholic paralysis is now well known in a good number of instances to be caused by the continuous use of alcoholic beverages. It begins very insidiously, and more often than not, the disease is far advanced before special notice is taken of it. The sensations it gives rise to are attributed to rheumatic pains. There is first numbness of the muscles of legs and feet, then darting pains from the soles upwards. Walking is performed with difficulty; and as the disease progresses, the muscles become wasted and flat, and are unable to contract. The sensibility is sometimes very acute at this stage, in others it is dulled. Bed-sores form towards the last, and death results. In these cases the Alcohol must exercise its deleterious action upon muscular substance, either through the nerves which supply it, or directly upon its vital cells. Whichever way it is, a fatal termination will result, unless Alcohol is abandoned in the early stages and never resumed.

Dr. Richardson lays particular stress on a disease of the lungs due to Alcohol, which he calls alcoholic phthisis; he says: "There is no form of consumption so

fatal as that from Alcohol." The membranous tissues are affected, congestion takes place, and the substance of the lung gradually undergoes destruction. Bronchitis is a very common complaint of hard drinkers, and pneumonia or acute inflammation of the lungs is frequently occurring with hard drinkers. Any exposure to the cold or damp which a sober person would resist with ease, results in inflammation of the alcoholized lungs, through their structure being weakened, their functions modified, and their blood-vessels congested with fluid.

Dipsomania, insanity, hysteria, and a great deal of nervous instability to which no name can be given, and which is the forerunner of grave nervous lesions, are some of the mental diseases produced by the use of Alcohol. There is a general falling off in the function of the brain, and the higher centres of thought, will, and reason are involved. Ideas become confused, memory deficient, and the power of speech weakened, sometimes completely lost, man thus losing his grandest attribute. A general paralysis of the brain takes place, and the seat and centre of thought, emotion, reason, and volition are for ever destroyed. Our lunatic asylums are filled with such cases, and the several inebriate homes scattered throughout the country also contain a great number of them.

Rheumatism is a disease always aggravated by Alcohol, especially in the form of malt liquors, and it is very often associated with gout, which has been inherited from alcoholic ancestors. It is then called rheumatic gout.

Anæmia from poorness of blood due to the pernicious effects of Alcohol upon the red blood-corpuscles, and

obesity from a large amount of unhealthy fat being deposited upon the organs and in the tissues of the system, are two very common conditions resulting from Alcohol; and, indeed, as Sir Andrew Clark very truly said, nearly seventy per cent. of the diseases in our midst are due directly or indirectly to the use of Alcohol. Seventy per cent.! Yet the evil still persists, and is known in all its hideous nakedness to the medical profession. Surely the time has come for undiluted frankness on the subject.

Whether Alcohol will be regarded in the future as a useful drug or not must remain a question for the decision of the medical faculty. At present the large majority of human beings are so saturated with Alcohol that its effects in properly prescribed therapeutic doses cannot possibly be estimated in disease. The tissues must become freed from the potent influence of this agent before any decision with regard to its remedial qualities are arrived at. A total abstainer (life-long) may possibly benefit by certain prescribed doses of Alcohol in disease, but it is impossible to give any opinion with regard to its universal application. We have the Temperance Hospital which treats disease without Alcohol, and with most satisfactory results as compared with other hospitals where Alcohol is in general use; we must await patiently the verdict of science on the use of Alcohol as a drug.

CHAPTER IV.

PHYSIOLOGY, PATHOLOGY, AND ALCOHOL.

Even the greatest opponent of total abstinence, the most ardent believer in Alcohol, must admit that certain sensations are produced after ingestion of even the smallest quantity of Alcohol. In these cases where the excessive use of beverages containing this article has brought about degenerative structural changes in the body, a small dose of Alcohol would probably produce no sensations whatever, but this dose does not apply to total abstainers and very moderate drinkers. It is a well-known fact, candidly admitted by the supporters of Alcohol, that intoxicating liquors are taken mainly for the physical sensations they produce—sensations which are attributed to the beneficial effects of Alcohol upon the system. The glass of wine which creates a sensation of warmth through the body, which seems to brace up the flagging nerves, to whip the heart into increased motion, to accelerate the motion of the blood through the blood-vessels, to bring the brain into livelier action, to assist the stomach in digesting, to restore muscular energy, etc.,—this glass of wine, small as the amount of Alcohol contained in it, is capable of producing all the varied and longed-for sensations; therefore, Alcohol, even in the smallest doses, has a decidedly physiological effect

upon the human system. We will consider what these effects are, both in large and small doses, and whether they are exercised for good or for evil.

On the introduction of any liquid into the stomach, it is absorbed into the circulation of the small veins ramifying on the surface, and in the coats of the stomach. Some of the liquid, whatever it may be, may penetrate to the duodenum (the first part of the small intestine following immediately upon the stomach), but when there, it is absorbed by the venous radicles in the same manner as in the stomach. Having entered the circulation, it is carried by the blood, first through the portal system of the liver, then through all the tissues and structures of the body, to the remotest parts of the human economy. As it passes through the blood-vessels of the lungs, it is brought into contact with the air contained in the air-cells, and by evaporation some of the vapour of Alcohol is given off in this way, and we are sensible of its presence in the expired air. Thus we know that unchanged (at any rate, during the first period of its contact with the tissues of the body) Alcohol circulates through the system, and can be detected (especially when taken without food) in the breath, and in the different secretions if examined for it. The earliest effect of Alcohol is produced upon the smaller blood-vessels. Their calibre becomes enlarged, thus allowing more blood to pass through them or to be contained in them. When the vessels are situated near the surface of the skin, as in the face, the colour is heightened. There is an increased quantity of the red fluid flowing through these more exposed or more superficial vessels. But it is not only in the blood-vessels of the face that the change has been

effected; if an examination of the different tissues throughout the body could be made during this period, it would be found that all the smaller blood-vessels had become enlarged in a similar manner, and that more blood was passing through them, producing the same flushed appearance. The above, then, is one of the earliest physiological changes produced by Alcohol, which no one who has ever taken this drug even in minute doses will deny. In order to understand the subject thoroughly, it will be as well to explain in what manner this change has been brought about—a change that is not only observable after the ingestion of Alcohol, but may be produced by exposure to heat, or by certain emotions, such as pleasure, surprise, etc.

There are two principal sets of blood-vessels in the body, the arteries, and the veins. The arteries contain red, arterialized or oxygenated blood; in the veins it is found to be of a deep purplish hue, owing to the presence of carbonic acid gas. The walls of the former are muscular and elastic, and do not fall together or collapse when cut through; the walls of the latter contain far less elastic tissue, and consequently collapse when there is no blood in them to keep them apart. Between these two sets of vessels, separating them from one another, and yet connecting them together, is a vast and minute system called the capillary system, perfectly invisible to the naked eye, and only to be seen under the high power of a microscope. The arteries have their origin direct from the left side of the heart, in a very large and strong vessel called the aorta. The aorta gives off large branches (not so large as itself) to the upper extremities, head, and chest, and whilst doing so turns upon itself,

forming what is called the arch of the aorta. It then penetrates the diaphragm and enters the abdomen, where still giving off branches to the contents of the abdomen, it finally divides into two large branches (opposite the lumbar vertebræ), one of which goes to each lower extremity. The arteries are continually giving off branches to supply the surrounding tissues, and they grow smaller and smaller, until at last it becomes impossible to trace them with the naked eye. But far more blood can be contained, and is contained, in all the smaller arteries together, than in the larger vessels nearer the heart. The veins begin in very minute vessels at their origin at the capillary system, and grow larger and larger as they approach the right side of the heart, into which they empty themselves by two very large vessels, one bringing the blood from the upper extremities, chest, and head, and the other from the trunk and lower limbs.

The capillary system is a close network of minute vessels, having but one coat formed of a kind of homogeneous structureless membrane, very fine and thin, through which fluids and gases can easily pass (from without and *vice versâ*). The diameter of these vessels is not larger than $\frac{1}{1500}$ of an inch. The network is so close that no vessel is longer than an inch, or an inch and a half. The holding capacity of the capillaries is immense, much as if a river, after being closed up between narrow banks, were to expand in a mighty lake. The holding capacity of the latter would be far greater than the narrow bed of the former. Thus the capillary network contains far more blood than the arterial and venous systems, large as their vessels are, put together. When

it is stated that the capillaries of the lungs alone, if arranged lengthwise, would reach from London to New York, some slight idea may be conveyed to the mind of the extent of the capillary system throughout the whole body. The smallest arteries insensibly terminate in the capillaries, the smallest veins have their origin from them. The blood traverses this vast network from the arteries to the veins, and it is whilst making the transit that its colour gradually undergoes the change from red to blue. The arterial blood contains oxygen, which is taken into the lungs with every inspiration, air being a compound of oxygen and nitrogen (the former 21 per cent. and the latter 79 per cent). As the blood traverses the lungs in the fine and delicate walls of the air-cells (of which there are about 600 millions in the lungs), the inspired air in the pulmonary cells gives up its oxygen to the blood, which is coloured red by it, and the carbonic acid gas is thrown off by the lungs, and thus leaves the body as one of the waste products of combustion. Thus the blood gives a poisonous and impure element to the air, and receives in exchange a life-giving and powerfully vitalizing element from the air. In the capillaries, the walls of which are delicately fine and thin, the oxygen of the arterial blood combines with the carbon of the tissues to form carbonic acid gas ($C O_2$). This is called the process of oxidation or combustion, and is that by which the uniform temperature is maintained, by which the waste products (or ashes) of the tissues are removed. The blood is not only a carrier of oxygen, but also conveys the nutrient elements of the food from the intestines to the different parts of the system. Indeed, the blood may be looked upon as the factotum of the

human body, so manifold and complicated are its various functions. In its passage through each secreting organ this wonderful fluid has to deposit the constituents which form the secretion; the saliva in the salivary glands; the gastric juice in the stomach; the bile in the liver; the pancreatic juice in the pancreas; the different intestinal juices; the urine in the kidneys; and the sweat in the sweat-glands of the skin. All these functions are performed with regularity and punctuality in the normal healthy condition, and it is only when disease is present in any of the organs, or an unstable equilibrium of the health exists, that the various functions of the blood are interfered with.

The entire vascular system is under the control of the nervous system. This will require a little explanation, as the action of Alcohol is not only exercised upon the blood-vessels, but upon the nerves which supply them with vitality and activity. There are two systems of nerves in the human body, the cerebro-spinal (consisting of the brain and spinal cord with the nerves coming off from both, to supply the different parts with sensation and motion), and the sympathetic or organic nervous system. The latter is the one with which we are most concerned at the present moment. It is found lying on each side of the entire length of the spine in the thorax and abdomen, and forms a series of ganglia connected by nervous fibres. The ganglia are composed of small masses or swellings of nervous substance, and are very numerous. The sympathetic nervous system spreads with its ganglia and nerve fibres over all the internal organs of the chest and abdomen, the heart, the liver, the stomach, and the intestines being very richly

supplied by it. It also sends out nerve fibres to the brain and spinal cord, and thus the two systems are in a manner connected with one another, and exercise certain influences over one another. Lastly, this organic or sympathetic system sends branches to all the blood-vessels of the body, especially to the smaller ones, and controls their calibre and movements. We can exercise no will power whatever, or at any rate but a very limited one, over the sympathetic nervous system, whereas we can exert a very powerful one over the cerebro-spinal system. In illustration of the manner in which the former does its work, I would call attention to the act of blushing. Some impression of a pleasurable or painful nature having struck the brain, it is instantaneously communicated to the sympathetic nervous system. The nerve fibres supplying the blood-vessels are affected to such an extent that temporarily they lose control over the muscular coats of the artery, which, relaxing, enlarge the calibre of the vessel and allow a larger amount of blood to be poured through them. Thus the blush is produced. Directly the impression is removed, or overcome by control of the will, the nerve fibres again exercise their restraining influence over the muscular coats of the artery, and only a moderate amount of blood is allowed to pass through. The influence of the sympathetic nervous system over the heart and blood-vessels, therefore, is a restricting one, for if the nerves supplying these were destroyed or cut through, the heart would take on a galloping action, and the blood-vessels would be dilated to their fullest extent, and an immense quantity of blood be poured into them.

Having given a short explanation of the anatomy and

mechanism of the circulation of the blood, we can proceed to examine the true and physiological action of Alcohol upon the blood-vessels. It is known and admitted, that a flushed condition is produced when even a small amount of any intoxicating liquor has been taken, this flush being caused by the dilatation of the small arteries and veins. It is now proved, I think, beyond doubt, that the condition is brought about primarily by the influence of Alcohol over the organic nervous system, this influence being nothing more nor less than a paralytic one. Temporarily the nerve fibres (as in the case of blushing from some great emotion) are paralysed, so that they no longer exercise that restraining influence over the muscular coats of the vessels which they do in the normal state, when there is no counteracting influence. Then again the influence is being exerted simultaneously over the heart, which beating more rapidly pours an extra amount of blood through the arterial system. When the nerve fibres have recovered themselves, when nature with her wonderful powers of recuperation has battled against and overcome this temporary paralysis, the nerve fibres return to their normal condition, and the blood-vessels to their normal calibre, and the flush gradually disappears. It may be argued that if a passing emotion, which may be innocent enough in its way, is capable of producing exactly the same physiological changes on the circulation as a glass of wine, and if the changes are deleterious to the circulation, then surely the one cause is as injurious as the other. I have not the slightest doubt that if the system were continually submitted to a series of nervous emotions, producing the results mentioned above, that in time, as we witness

with the continual use of Alcohol, a temporary paralysis of the nerve fibres would be converted into a permanent paralysis of the same, and serious damage wrought to the heart and blood-vessels. We know how strongly the nervous system can be affected through the emotions, and we have even heard of broken-down hearts, if not of actual broken hearts, through the same means. At any rate, we know for a scientific fact that the continual use of alcoholic beverages produces a paralysed condition of the organic nervous system, resulting in permanent dilatation of the blood-vessels apparent on the faces (especially the most prominent part of the face, the nose) of habitual drinkers.

Under the continued daily use of an article which every time it is ingested produces the same physiological results, the disturbances that I have mentioned above must produce permanent injury to the organic nervous system. That such is the case can scarcely be denied by those who have any physiological knowledge of the subject whatever. Of course the changes are in proportion to the amount of Alcohol habitually taken, those who confine themselves to a very moderate daily dose having their nervous centres, heart, and circulation less affected than the hard drinkers. But all the same, whether the dose be very moderate or the reverse, a poisonous and dangerous influence is being exercised with damage to the system of a more or less serious nature.

Upon the heart Alcohol exercises a decided influence, not primarily, but through the organic nervous system, which governs or controls the movements of this organ. As the paralytic action is established over the nerves

and ganglia supplying the heart, the movements or impulses of the heart become accelerated. These phenomena were first thoroughly examined by Dr. Parkes and Count Wallowicz, who conducted a series of experiments of a most interesting nature on the action of Alcohol upon the heart. I think there is not a temperance work of any pretension which does not record *in extensô* the observations of these two scientists with regard to this matter, and therefore I need make no apology for introducing the results of their researches in these pages. They made a calculation that the heart of a full-grown and healthy adult beats on a average 106,000 times during the twenty-four hours. In the early periods of the administration of Alcohol, the beats were increased to 127,000, about 21,000 more, and later on they numbered 131,000, or 25,000 more than the average daily number of beats.

"On the 7th day, with one fluid ounce of Alcohol, the heart beat 4,300 times more.

"On the 10th day, with two fluid ounces, 8,172 times more.

"On the 11th day, with four fluid ounces, 12,960 times more.

"On the 12th day, with six fluid ounces, 30,672 times more.

"On the 13th day, with eight fluid ounces, 23,904 times more.

"On the 14th day, with nine fluid ounces, 25,488 times more.

"But as there was ephemeral fever on the 12th day, it is right to make a reduction and estimate the number of beats in that day as midway between the 11th and

13th days, or 18,432. Adopting this, the mean daily excess of beats during the alcoholic days was 14,492, or an increase of rather more than 13 per cent. The first day of Alcohol gave an excess of 4 per cent., and the last of 23 per cent.; and the mean of these two gives almost the same percentage of excess as the mean of the six days.

"Admitting that each beat of the heart was as strong during the alcoholic period as in the water period (and it was really more powerful), the heart on the last two days of Alcohol was doing one-fifth more work.

"Adopting the lowest estimate which has been given of the daily work of the heart, viz. as equal to 122 tons lifted one foot, the heart, during the alcoholic period, did daily work in excess equal to lifting 15·8 tons one foot, and in the last two days did extra work to the amount of 24 tons lifted as far.

"The period of the rest for the heart was shortened, though, perhaps, not to such an extent as would be inferred from the number of beats, for each contraction was soon over. The heart, on the fifth and sixth days after Alcohol was left off, and apparently at the time when the last traces of Alcohol were eliminated, showed in the sphygmographic tracings signs of unusual feebleness; and, perhaps, in consequence of this, when the brandy quickened the heart again, the tracings showed a more rapid contraction of the ventricles, but less power than in the alcoholic period. The brandy acted, in fact, on a heart whose nutrition had not been perfectly restored."

We will confine ourselves to a consideration of the state of the heart after seven days' ingestion of one fluid

ounce of Alcohol, when we learn that there was an increase in the beats amounting to 4,300 times more than normal or during the water period. It is quite certain that this large increase in the number of beats is not due to additional strength of the muscular fibres of the heart, but to the action of a temporary stimulus, which, if withdrawn, leaves the heart beating less powerfully and less regularly than before. If Alcohol added to the muscular strength of the heart, the feebleness which attends its withdrawal would not be so apparent. Those who habtiually use Alcohol, to the extent of about six fluid ounces per diem, are engaging the heart to perform a large amount of extra work every day, equivalent to lifting fifteen tons one foot; this, added to the normal work of this organ, which is estimated as equal to 122 tons lifted one foot, gives a sum total of 137 tons, lifted one foot. It is quite possible that the heart may have this extra work to perform without feeling the effects of it for some time, but in the long run it will be found that the same quantity of Alcohol fails to produce the desired effect, and a little more has to be added. The truth is, that the heart flags after so much extra labour, gets in time worn out, improperly nourished and enfeebled. The muscular fibres of the ventricles are those which suffer the most, because they have the greatest amount of work to perform, by contracting upon the blood they contain to send it through the lungs and the entire body. They have, in addition, to overcome arterial resistance and tension. The large and small arteries, the capillaries and veins, are full of fluid, and the contracting ventricles have to force still more fluid into them. Each ventricle holds about three ounces of blood,

and from 70 to 80 times every minute this amount has to be poured through the lungs from the right ventricle, and into the aorta from the left ventricle. In order that this work should be performed with sufficient force and regularity, the muscular walls of the ventricles are found to be of unusual strength, solidity, and thickness. The fibres are arranged in a spiral form, seven or eight layers deep, each layer being easily separable from the one beneath it. The spiral arrangement of the muscular fibres of the heart is peculiar, but gives strength and firmness to the ventricles, and also causes, as the fibres contract, the tilting forward of the apex of the heart against the side of the chest, thus constituting the heart's beat.

The muscular structure of the heart partakes of the character of involuntary muscular fibre as distinct from the voluntary muscular fibres which we meet in the muscles over which the brain and spinal cord have control. Examined microscopically there are found to be essential anatomical differences which need not be entered into here, as it scarcely affects the question of the work of the muscle. The natural law of all muscular structure, whether voluntary or involuntary, is that rest is required after action. No labourer could keep continually at any muscular work, even supposing his nervous system did not give way. As the work continued, the muscle would less and less respond to the command of the will, and would at last refuse to do any more, until its nutrition was restored and rest had been taken. A last supreme effort might be made to extract a still further amount of work from the exhausted muscle, but the effort might only be accomplished at the expense of life

itself. Thus it is with the heart. Nature has so ordained it that after each beat of the heart, a period of rest should follow, so that the muscular fibres of the ventricles should recover themselves. When Alcohol is taken, this period of rest, owing to the increased rapidity of the heart's contractions, is lessened, and the muscular fibres in time become exhausted and enfeebled. The result of this exhaustion can be witnessed in the sphygmographic tracings taken of the pulse of those who habitually use Alcohol. Dr. F. R. Lees, of Edinburgh, conclusively proved that on the *third* day of Alcohol drinking, the tracing taken from the pulse of the person experimented upon showed distinct signs of fatigue. It was *irregular* and *disturbed*. He sums up with these words in italics: "Heart doing more work in a given time—and period of rest for heart shortened."[1] All that Alcohol can do is to liberate stored-up energy, and to make use of that until it is all gone, leaving the heart bankrupt. There is a certain amount of latent energy in all the tissues of the body; it is upon this we depend when disease, either acute or chronic, invades our system. If, however, there has been a long history of Alcohol, the natural powers of resistance are undermined, the latent energy upon which we depend to fight the disease is exhausted, and life is imperilled. In the case of the heart, Alcohol has only acted as a spur similar to that applied to the flanks of the horse: it has whipped it into increased action for a

[1] "Text-book of Temperance." Dr. F. R. Lees. In some sphygmographic tracings the pulse curve shows excessive departures from the normal when the system is under the influence of Alcohol.

time, but has lessened its period of rest, and therefore its powers of nutrition.

We find after ingestion of wholesome food that the pulse is stronger and fuller, that the temperature is slightly raised, the heart beats with greater force and regularity. In this case the results have been brought about, not by a temporary paralysis of the nerves supplying the heart and blood-vessels, as in the case of Alcohol, but by a richer blood supply, the blood being provided with material for the nourishment of the tissues from which the heart and vessels benefit. In one case the heart has been whipped into an injurious and unnecessary action, which in the long run is fatiguing and depressing to it, and in other it has received nourishment and therefore strength. It is from the continuous absorption of nutriment by the system, that sufficient energy is laid up in the tissues, not only for their daily use, but to be called upon in times of need. If, however, there is a constant call upon this reserve energy, which Alcohol makes even in small doses (those which Sir Sir Andrew Clark describes as "the physiological quantity"), in times of great need there is nothing to fall back upon, the capital has been expended, and physical ruin stares one in the face.

The heart and the blood-vessels, as I have attempted to show, are influenced in their movements by Alcohol through the system of nerves which governs them, but Alcohol also exercises a direct influence over the muscular structure of both, which has been referred to in the foregoing chapter. The blood itself undergoes certain physiological changes due to its direct contact with this powerful poison. I have before alluded to the incontestable fact

that Alcohol absorbs water, has indeed a special chemical attraction for this element over all others. This being the case, and water being in large excess in the blood (970 parts in 1000), Alcohol greedily absorbs its atoms, in proportion to the strength and amount of the spirit present. Dr. B. W. Richardson has pointed out that the action of Alcohol upon the blood may be a twofold one. He says: "It may fix the water with the fibrine, and thus destroy the power of coagulation; or it may extract the water so determinately as to produce coagulation;" [1] and again: "In quantities that can be tolerated it affects the blood, making that fluid unduly thin or coagulating it, according to the amount of it that is carried into the circulating system." [2] Thus a contrary condition may be brought about by the very same agent on the very same tissue.

In order to explain what is meant by the coagulating tendency of Alcohol upon the blood, it would be as well to understand the constitution of this fluid. The basis of blood is water, in which are suspended certain solid matters in solution; these are fibrine, albumen, salts, fat, sugar, and effete matters from the waste products of the body.

In 100 parts there are 79 parts of water and 21 parts of solid matter. Of these 21 parts, 12 parts are roughly taken up by the corpuscles of the blood, and the remaining 9 parts by the albumen and fibrine. The salts, fats, etc., are in the proportion of 1 to 2 parts in 100, and the other matters are very minute in proportion.

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[1] "Cantor Lectures," by B. Richardson. Page 45.
[2] "Results of Researches on Alcohol."

In 1000 parts, there are of—

Water	790 parts.
Albumen	70 „
Fibrine	2·3 „
Salts (Sodium and Potassium), Fatty matters (Stearin, Palmitin, etc.)	10 „

Of gaseous matters in the blood,—and we have seen that this fluid has the power of absorbing gases and carrying them about the body for its use,—100 cubic inches contain 50 cubic inches of carbonic acid gas, oxygen and nitrogen.

The blood has an alkaline reaction, and its red colour is due to the red corpuscles, which are in such vast numbers that they are enabled to give to the blood its distinctive and characteristic hue. The blood-corpuscles, or blood-cells, are only discernible by aid of the high power of a microscope. When a drop of blood is placed under a low power, it looks as if one were gazing on a field of shifting sand, one cannot distinguish anything very clearly. But placed under a high power, the different parts come into clear view, and then the blood-cells are distinctly visible. Minute round bodies are seen floating in a clear fluid; they are somewhat depressed in the centre, raised at the sides (not unlike the muffin), with smooth outline. The colour is of a pale straw hue, but it is the aggregate of these tiny cells which produces the deep red with which we are familiar. Their diameter is not larger than $\frac{1}{3000}$ to $\frac{1}{3500}$ of an inch, and a cubic inch of blood contains as many as 70 thousand millions of these minute bodies. They are rather sticky, and have a habit of running together in what are called

rouleaux, so that they somewhat present the appearance of a number of coins placed one on the top of the other. If we examine the web of a live frog under the microscope, we can actually observe the circulation in the capillary vessels. The red blood corpuscles are seen keeping to the middle of the stream, whilst clinging to the walls of the vessel certain little bodies are visible, much fewer in number than the red cells, and white in colour. These are called the white corpuscles; they are different in structure, function, and shape from their more numerous neighbours, and there is about 1 to every 800 or 1000 of the red cells. The colour of the red cells is due to a substance called hæmoglobin. The important function of the blood is situated in the red blood-corpuscles. They possess the wonderful power of fixing gases, and conveying them from one part of the system to the other. In the lungs they seize hold of the oxygen of the air and carry it to the capillary circulation, where, owing to the thinness of the walls, it passes through into the surrounding tissues, and combines with the carbon to form carbonic acid gas ($C O_2$). The poisonous carbonic acid gas is conveyed by the red blood-corpuscles through the veins, right side of the heart, into the lungs, where it is given up to the air. Any agent which modifies or injures the action of the red blood-corpuscles is one which must in time impair the vitality of the whole system. In Alcohol we find an agent which not only affects the watery and fibrinous parts of the blood, but seriously damages the red blood-corpuscles. It possesses the harmful and vicious power of seizing upon the oxygen held by the red corpuscles, thus preventing it from being deposited in the tissues. It also deprives

the corpuscle of its water, thus modifying and changing its shape, which instead of being rounded, becomes elongated, oval, crenated, or stellate (the outline from being rounded becoming jagged and notched), and in some instances, as observed by Dr. B. W. Richardson, "truncated." With these changes in the red blood-corpuscle there is a corresponding diminution in their power of holding gases, and of performing their important function. Thus the process of oxidation in the tissues is interfered with, and this may be the reason of a diminution in the amount of carbonic acid gas eliminated from the lungs of those who ingest Alcohol. Fortunately, the recuperative power of the red blood-corpuscle is enormous, many millions of these tiny bodies being destroyed every minute, and replaced by fresh ones, which spring either from the white cell or from cells originating in the liver or spleen.[1] If it were not for this recuperative provision of nature, Alcohol, through its directly deleterious influence upon the blood, would destroy its victims by hundreds of thousands, instead of by tens of thousands.

Blood, when drawn from the living vessels in which it circulates, passes into a condition known as coagulation. Healthy blood in the healthy human being never undergoes this change, it is only when disease occurs in the blood itself, or in the walls of the blood-vessels, that coagulation can take place in the living body. When blood is drawn and allowed to remain in a basin, it will gradually solidify, until it has the appearance of a jelly.

[1] The origin of the red blood-corpuscle is still a debateable point.

"The vessel into which it has been shed can at this stage be inverted without a drop of the blood being spilt. The jelly is of the same bulk as the previously fluid blood, and if forcibly removed, presents a complete mould of the interior of the vessel."[1] If allowed to remain in the vessel, a second change will gradually occur. Floating in a pale straw-coloured fluid, called the serum of the blood, a small clot of a firm, dark-red substance will be seen. On examination this clot will be found to consist of a network of fine fibres, in the meshes of which are entangled the red and white corpuscles of the blood. The coagulation is primarily due to the fibrin of the blood becoming more or less solidified by contact with the air; and although there is such a very small portion of this substance in normal blood, yet it possesses the power of developing into fine fibres and forming a clot.

When a clot is formed in the blood-vessels of the human body, however small it may be, it proves fatal to health, and oftentimes to life itself. In certain diseased conditions of the blood or blood-vessels, a clot sometimes forms, in just the same way as described above, and then it is carried along in the circulation to the smaller vessels, through which it cannot pass. The result is either the bursting of a vessel, probably in the brain or the lungs, or a blocking up of the circulation to that part, producing changes in the tissues which are supplied by this particular vessel. Thus a stroke of apoplexy may suddenly occur, or a gradual softening of the brain, both of which will be referred to later on. Certain agents will retard

[1] "A Text-book of Physiology," by Dr. M. Foster.

coagulation and altogether prevent it, whilst others hasten it. Amongst the latter may be mentioned the presence of any foreign substance in the circulation, which attracts the fibrine to form and to seize hold of the corpuscles. A roughening of the internal membranous coat of the artery will assist in forming solid fibrine, and slowly moving blood will also hasten coagulation in the living vessels. Alcohol is one of the most powerful external agents for effecting this change in the blood, when present in sufficient quantity. By extracting water from the blood or unduly mixing with it, the blood is rendered too rich in fibrinous matter, altogether too solid for circulation through the finer vessels of the system, and thus clots are gradually formed, which interfere with the general circulation. I have already quoted from Dr. Richardson to show that exactly the opposite conditions may be set up in the blood by the same agent. He finishes by saying, "These facts bear on a new and refined subject of research with which I must not trouble you further, except to add that the inquiry explains why in acute cases of poisoning by Alcohol the blood is found sometimes quite fluid, at other times firmly coagulated in the vessels."[1] It has been observed by some experimentalists that alcoholized blood *outside* the body coagulates more slowly, and contains less fibrine than normal healthy blood. Virchow notices just the contrary condition of things, and says, as the result of his experiments on the use of beer, that there "was a decrease of water, and an increase of fibrine and of coloured clots." It is quite possible that the differences noticed in the

[1] "Cantor Lectures," page 46. Dr. B. Richardson.

blood of alcoholized people are a matter of individual idiosyncrasy, one person's blood inclining to become watery and thin under the influence of this agent, and and another's to become thickened. And again, the differences may also largely depend upon the species and quantity of Alcohol ingested. Alcoholic beverages containing, for instance, fusel oil (and this form of spirit is largely employed in the composition of many intoxicating liquors) may bring about a different condition of the blood from those which are composed entirely of the pure Ethylic Alcohol. The effect of all the various forms of Alcohol upon the different parts of the human system is not yet investigated to any definite extent; and until such researches have been conducted, it is almost waste of time to theorize. Dr. Richardson, in his Cantor Lectures, has very carefully described the *phenomena* exhibited by animals after the ingestion of different Alcohols, such as the Methylic, Butylic, Amylic, Sodium, Potassium, and Sulphur Alcohols; but he has not described whether the changes that occur in the blood are similar to, or different from, those observed after the ingestion of the ordinary Ethylic Alcohol, excepting in one instance. It appears that the Sodium and Potassium Alcohols, brought into contact with the blood, in solution, produce "an almost instant crystallization of needle-like crystals, spread out in beautiful arborescent filaments."

Upon living blood, Alcohol thus produces a series of phenomena, which give rise to certain marked effects. Through its interference with the oxygen-carrying functions of the corpuscles, the process of oxidation is more or less prevented, and effete matters are retained in the tissues which are a positive source of injury and

disease to the system. Through its action upon the fibrine, or albuminous parts of the blood, and its power of absorbing water, it tends to promote the formation of clots. These bring about a tendency to disease, and instantaneous death is not unfrequently the result of their presence in the system. Very often Alcohol renders the blood poor, thin, and watery. It becomes anæmic. Anæmia is a condition of the blood in which the red blood-corpuscles are found deficient in number, and where there is an excess of the white corpuscles. If a drop of blood is taken from the veins of an habitual drunkard and examined microscopically, it will be found to present more white corpuscles than the average in health, and the red ones will be greatly diminished in number. The latter may also be found adhering too closely together, and forming little masses, which in the living capillary vessels would certainly tend to block up these tiny canals. This anæmic condition of the blood interferes with the nutrition of the heart and of the blood-vessels, which show it by feebleness and irregularity of action. There is a wide difference between the blood of a healthy person and a total abstainer and that of an alcoholic.[1] An extensive but gradual degeneration takes place in the case of the latter, which total abstinence often fails to overcome when it has been prescribed as the only cure. It is truly said that the blood is the life, and when this fluid becomes vitiated to any extent, there is always some evidence of it in the general condition of the health, which becomes unstable and very often completely

[1] A large development of fatty globules has also been observed in the blood of alcoholic persons. Magnus Huss was the first to point out this pathological peculiarity.

destroyed. It is absolutely certain that, if the blood is not healthy, the various tissues and structures of the body will more or less suffer, metamorphosis will be imperfect if not altogether prevented, nutrition will be profoundly affected, and the work of the organs will be performed with difficulty.

The stomach is one of the first organs with which Alcohol comes in contact after ingestion. It is a large and hollow organ, composed of two layers of involuntary muscular fibres, arranged circularly and longitudinally, some of which take an oblique direction. This arrangement of the muscular fibres allows of a good deal of movement in the stomach during digestion. The internal surface is covered with a greyish pink mucous membrane of fine and delicate texture, not unlike that which lines the cavity of the mouth. It is studded with innumerable apertures (only to be seen microscopically), which are the mouths of the canals leading to the peptic glands where the gastric juice is manufactured. The stomach is richly supplied with blood-vessels, ramifying on its external and internal surfaces, and in its muscular substance. The glands are surrounded with small blood-vessels, from which they extract the necessary material for the formation of the gastric juice. The stomach is under the control of the sympathetic nervous system, and has a large supply of nerve ganglia and fibres which control its muscular movements, and also the amount of gastric juice to be secreted by the glands. On introduction of food into the stomach, the mucous membrane reddens, owing to an increased flow of blood into the blood-vessels, the gastric juice pours out from the mouths of the glands, and digestion commences.

The gastric juice is a thin colourless fluid, mainly composed of water, and acid in reaction owing to the presence of hydrochloric acid. It contains a ferment called pepsine, a peculiar compound, which in conjunction with the acid has a definite action over all forms of nitrogenous or albuminous foods, converting them into *peptone*, a substance easily assimilable by the membranes with which it is brought into contact in the intestines. The stomach only feebly absorbs peptones, but largely absorbs all kinds of fluids; thus, when digestion is completed (in from four to six hours after a full meal), the semi-fluid mass passes from the stomach through the pyloric orifice into the first part of the small intestine, there to be further acted upon by the bile, pancreatic juice, and *succus entericus*, or secretion of the intestine. The solid meal which we have taken at lunch or dinner looks very different after four hours' contact with the gastric juice. According to Professor Huxley, it has very much the appearance and consistence of pea-soup, and is quite acid in reaction. The gastric juice has no influence over starch, sugar, or fat. The first is acted upon by the saliva in the mouth, owing to the presence of a peculiar ferment called ptyalin, which converts starch into grape-sugar, as starch is not assimilable in its original form in the system. Any starch which has not been changed into grape-sugar by the saliva is further transformed into that substance by the action of the pancreatic juice, whilst the bile (formed in the liver) and in combination with pancreatic juice has more or less action over fats. These are broken up and divided into minute particles, forming an emulsion, and by the aid of the bile can easily pass through animal membranes.

If a small quantity of brandy or whisky is held in the mouth for some little time, and the mucous membrane then examined, it will be found to present a whitened appearance, and the surface seems to be raised from the parts underneath. A burning sensation, almost amounting to pain, will have been experienced, and then insensibility in the part. An excessive thirst will be felt. The last is produced by Alcohol seizing hold of and absorbing the water contained in the membranes and in the saliva. The nerves of these parts, especially those supplying the lining membrane and blood-vessels, are temporarily inflamed, and this inflammatory action is communicated through the brain to other nerves in their vicinity, producing different effects.[1] The eyes readily water, and in fact overflow with tears, the vocal chords for a moment seem paralysed, and the mucous membrane of the mouth and throat is without sensation of any kind. Persons suffering from toothache will often hold some kind of undiluted spirit in their mouths in close contact with the offending tooth, in order to procure relief. The relief is really obtained by depriving the nerve supplying the tooth of all sensation, which clearly shows the paralysing influence of Alcohol over nerve fibre. In this instance, Alcohol acts as a true narcotic, or we might say that in small doses Alcohol acts as a stimulant, and in large doses as a narcotic. When taken in small doses, the salivary secretion is increased, and flows out readily from the glands situated beneath the mucous membrane. The Alcohol has acted as a temporary stimulus upon the blood-vessels of the glands, bringing them into increased

[1] This is an instance of reflex action.

action, and procuring an extra flow of saliva, of which it absorbs the water. It is a very significant fact that drinkers (especially those who confine themselves to the stronger wines and spirits) are nearly always consumed by thirst, and it is the constant desire to satisfy this sensation which leads them again and again to resort to the thing which has produced it. With beer-drinkers, the thirst that is experienced is often brought about by the amount of salt and sugar which is introduced into the various beverages by dishonest publicans to procure customers.

If the saliva is deficient in quantity and in quality (for the action of Alcohol is to deprive this fluid of its true function), the starchy parts of food, which are largely converted into grape-sugar in the mouth by this fluid, will not be efficiently acted upon, and their presence in the stomach will interfere with the proper course of digestion. In very moderate drinkers these changes are not likely to occur, as the spirit, whilst one is drinking, is not long enough in contact with the tissues and the saliva to affect them to an appreciable extent. It is in the immoderate drinker, the habitual drunkard, that changes in the mucous membrane of the mouth and the salivary secretion are noticeable.

When Alcohol reaches the stomach, where it remains much longer in contact with the tissues before absorption takes place, it mixes with the gastric secretion. In the first place, the presence of Alcohol in this organ, even in the smallest doses, excites an increased flow of gastric juice from the peptic glands. It acts in the stomach as it did in the mouth in large doses. It stimulates the nerves which supply the blood-vessels and glands of the

stomach. The vessels are dilated, more blood is sent through them, the glands work with greater activity, and a larger amount of gastric juice is therefore secreted, and poured into the stomach. The Alcohol, according to its strength and quantity, then seizes hold of the water which is the main constituent of the gastric juice, and thus injures and very often destroys the power of the latter.[1] Having become saturated with as much of the water as it can hold, the diluted spirit is absorbed by the blood-vessels and carried into the circulation. Meanwhile the gastric juice, deprived of a good part of its most necessary constituent, the water, is left to act upon any food which may be present in the stomach. When no food is present, it gradually ferments, undergoes decomposition, sets free certain gases, the presence of which is very unpleasant, and gives rise to various dyspeptic symptoms. The stomach is always more quickly and more injuriously acted upon by alcoholic beverages alone than when food is taken with them, and very often it experiences no sensation of a painful nature even when the mucous membrane has been found congested, ulcerated, and almost destroyed.

The remarkable case of Alexis St. Martin has been too valuable a theme for physiologists and medical men for me to pass it by without any observation. This unfortunate man lived for several years with a bullet wound in his side that penetrated his stomach, of which the interior could be well seen.[2] He came under the observation of

[1] A very small proportion of Alcohol is converted in the stomach by the action of the acid gastric juice into acetic acid.

[2] The aperture was about two and a half inches in circumference, never healed, and was kept covered by a compress.

a most intelligent and painstaking man, a surgeon in the United States army, who carefully described the effects of different agents upon the gastric juice and mucous membrane of the stomach. He noted what took place under a total abstinence (from Alcohol) regimen and under an alcoholic regimen. In the former, the mucous membrane was deepened in colour, the presence of food in the stomach acting as a stimulus upon the blood-vessels. The gastric juice was freely secreted and acted vigorously upon the contents of the stomach, converting them into a semi-fluid mass. After the passage of the digested material into the intestines, the stomach would return to its normal condition, pale greyish pink mucous membrane, without any exudation of an unhealthy nature, and clear, colourless secretion.

Dr. Beaumont then administered Alcohol to St. Martin freely for several days, and we read, as the result of this treatment, that the inner membrane was morbid with considerable inflammation, ulcerous patches were exposed, and the secretions became vitiated. He then extracted about an ounce of gastric juice, which he describes as *not clear and pure as in health, but quite viscid.* The next day he pursued his investigations, and reports the following: "Circumstance and appearances very similar to those of yesterday morning. Extracted an ounce of gastric juice, consisting of unusual proportion of vitiated *mucus, saliva,* and *some bile,* tinged slightly with blood, appearing to exude from the surface of the inflammation and ulcerous patches, which were more tender and irritable than usual. St. Martin complains of no pain." Twenty-four hours later he again examined the stomach,

and wrote: "Inner membrane of stomach unusually morbid; inflammatory appearance more extensive, and spots more livid, from the surface of some of which exuded small drops of grumous blood. The ulcerous patches *larger* and numerous; the mucous covering thicker than common; and the gastric secretion much more vitiated. The gastric fluids extracted this morning were mixed with large proportions of thick, ropy mucus, and considerable muco-purulent matter, slightly tinged with blood; . . . uneasy sensation and tenderness at the pit of the stomach, and some vertigo, with dimness and yellowness of vision on stooping and rising again; has a thin yellowish brown coat in his tongue, and the countenance is rather sallow." The day following we read that "the odour was peculiarly fetid and disagreeable," and that the inflammatory appearances were very extensively diffused over the internal membrane of the stomach.

Dr. Beaumont discontinued the administration of the spirituous liquors, and the stomach gradually returned to its normal and healthy condition. It is very interesting to note the remarks of this able observer upon the results of his experiments, carried on through a long course of years under the most exceptional circumstances ever known to exist. He says: "It is interesting to observe to what extent the stomach, perhaps the most important part of the animal system, may become diseased without manifesting any external symptoms of such disease. Vitiated secretions may also take place, and continue for some time without affecting the health in a sensible degree." And in another place he adds: "The free use of ardent spirits, wine, beer, or any of the intoxicating

liquors, when continued for some days, has constantly produced morbid changes." [1]

Dr. Aitken, in support of, or in independent testimony of, the *ocular demonstrations* of Dr. W. Beaumont, in his "Practice of Medicine," says: "When spirituous liquors are introduced into the stomach, they tend to coagulate, in the first instance, all albuminous articles of food or fluid with which they come into contact; as an irritant they stimulate the glandular secretions from the mucous membrane, and *ultimately lead to permanent congestion of the vessels* and to *thickening* of the gastric tissues. In these effects it is impossible not to recognise the operation of an agent most pernicious in its ultimate results. The coagulation is very different from that effected by the gastric fluids, and tends to render the articles more difficult of solution by the gastric juice."

The testimony of these observers could be multiplied *ad libitum*, but it would be found nearly always unanimous. Science has but one aim—the search after truth. Whether that truth should prove pleasant or unpleasant to the mass of mankind is of little moment to scientific men, for they themselves are not always the first to benefit from the truths which they have discovered. We must allow something for the vagaries and inconsistencies of the human mind; it is only by doing so that we can possibly understand the strange anomalies we witness on every side. Doctors who prescribe Alcohol, doctors who partake of Alcohol, doctors who die from the effects of Alcohol, are facts to which we cannot close our eyes, and

[1] "Experiments and Observations on the Gastric Juice, and the Philosophy of Digestion." William Beaumont, M.D.

which we cannot always understand, when we know that these men have had special medical training, have observed the origin, development, and crisis of disease, and have had access to a special class of literature which is repugnant to the laity. Surely King Alcohol has had a long reign, and now deserves that a medical Cromwell should put an end to his existence by despotically depriving him of a head-piece that has conceived and effected naught but ruin, misery, disease, crime, and vice.

As has been clearly shown, in the case of Alexis St. Martin, a very extensive condition of disease may be present in the stomach without giving rise to acute symptoms. If we had a wound on the external surface of our bodies, answering the description that seen on the mucous membrane of this man's stomach, after several days' indulgence in Alcohol, we should leave no stone unturned to get rid of it, and bring our skin back to a healthy condition. But because we do not actually *see* what takes place in the stomach, we day after day go on adding to the evil, until we gradually fall into, first, a constantly ailing condition, and, secondly, into a state of chronic disease, which may terminate fatally.

To sum up the physiological effects of Alcohol upon the stomach, it may be said that this spirit directly exerts a deleterious effect upon the delicate and sensitive lining membrane of that organ. By daily excessive ingestion it becomes thickened, and exudes a thick ropy mucus, which, mingling with the gastric juice, interferes with the healthy action of the latter upon the food contents of the stomach.

Alcohol precipitates the pepsine of gastric juice almost immediately the two are brought into contact, thus pre-

venting the latter (the gastric juice) from converting the proteid food into peptones. Its natural power, therefore, is destroyed. As Lauder Brunton says: "Even when the quantity of Alcohol is insufficient to precipitate the pepsine, it seriously impairs its digestive properties." [1] Which means that even small doses of Alcohol will impair digestion, and when those small doses are continued daily, over a course of years, the stomach must become in time more or less seriously affected.

In large doses the irritation is so great upon the lining membrane, that the gastric juice is lessened in quantity, and mucus alone secreted.

The water of the stomachic tissues and gastric juice is absorbed to saturation by the Alcohol, and the most beneficent aid to the solution of the solid food in the stomach is therefore withdrawn.

Alcohol also coagulates albumen, as can easily be seen by placing a portion of white of egg in a glass, and pouring some spirit upon it. It does the same thing in the stomach, and coagulates the albuminous portions of the food, preventing the gastric juice from properly performing its function, that of acting upon the proteid or albuminous elements of food.

In small doses Alcohol tends to stimulate the secretion of gastric juice, in large doses to suppress it altogether. It exerts its paralytic influence over the nerves of the stomach and those supplying the blood-vessels of this organ, just in the same way as over the nervous system and circulation generally. In time the dilatation

[1] "The Influence of Stimulants and Narcotics." T. Lauder Brunton, M.D., etc. "Book of Health."

of the blood-vessels becomes permanent, and the muscular movements of the stomach (which during digestion are very active indeed, producing a kind of churning action of which we are quite unconscious) are lessened owing to the paralysis of the nerve fibres.

The physiological changes brought about by Alcohol upon the stomach would be of a far more rapid nature, if absorption did not take place soon after its ingestion. Digestion would be retarded almost indefinitely by the presence of Alcohol, if the blood-vessels of the stomach had no power of absorption. But by the wonderful process of osmosis (by which fluids and gases can easily pass through animal membranes), nature is enabled to free the stomach of substances which are poisonous and deleterious to it.

Besides the sympathetic or organic nervous system (which is mainly composed of fibres of simple structure and ganglia, and which is found in the cavity of the thorax and abdomen, ramifying on the different organs as described above), there is the principal nervous system of the body—the cerebro-spinal. This system comprises the brain, the spinal marrow, and the white nervous cords emanating from both, and going to the muscles and organs of sense. The brain occupies the whole of the cavity of the skull, and is divided into two equal hemispheres, which are joined by a bridge of nervous matter at the base of the organ. Beneath the brain and at the back part of the skull, quite overlapped by the hemispheres, and almost hidden from view, is another and much smaller brain, which is called the cerebellum, or little brain. Cerebrum, or great brain, is the name given to the two large and important hemispheres which form

the brain proper. At the base of the brain a column of nervous matter penetrates a large round aperture in the skull, and enters the spinal cord. Thus the brain and spinal cord are directly united, and intimately connected with one another. The spinal marrow occupies the cavity of the spine, and becomes much narrower as it approaches the sacrum. On each side of the bony spine are a series of small apertures through which emanate the nerves from the spinal marrow to the different muscles of the trunk and limbs. Through various apertures of the skull pass nerve fibres from the brain to the organs of sense, providing sight, hearing, smell, and taste.

The brain is surrounded and enveloped by three investing membranes. The most external is strong, tough, and comparatively thick, lies in close apposition to the skull, and is called the dura mater. The middle membrane is a very fine tissue, not unlike a cobweb in structure, and connects the dura mater with the pia mater. It is called the arachnoid membrane, and secretes a fluid, the arachnoid fluid, which supplies moisture, separates the parts, and imparts a certain amount of elasticity to the surrounding tissues. The most internal membrane, or the pia mater, is of fine and delicate structure, closely invests the brain substance, and enters the minute divisions of the brain. This membrane is highly vascular. The cerebrum is not continuous on the surface, it is made up of convolutions. To explain more clearly, it should be said that the external surface of the brain to the depth of about a half to one inch is thrown into a quantity of folds closely placed together. These are the convolutions, which, if flattened out, would cover a very extensive surface. It is said by physiologists and phren-

ologists that the number and extent of the convolutions denote intellectual capacity. The fewer the number of the brain folds the more limited the brain power, and *vice versâ.*

The substance of the brain is white on the inside and grey on the outside, the latter colour extending to about the depth of a quarter of an inch. It is composed of nerve cells and fibres, the fibres ramifying from the white to the grey matter, and traceable to the spinal cord itself. The brain substance is richly supplied with blood-vessels. The spinal marrow has very much the same structure as the brain, excepting that the white matter is external and the grey matter internal. It is also invested by three membranes answering very much to the same description as those of the brain.

The spinal nerves, which issue from the apertures on each side of the spine, rise by two roots, the posterior and the anterior, the former conveying sensation, the latter motion to the nerves. These two join together immediately after their origin, and the nervous cord then runs along the course of a muscle, distributing branches as it goes, and getting smaller and smaller until it is finally lost sight of in the substance of the muscle. The termination, when seen under the microscope, is sometimes found to be in a small nervous expansion oval in shape and flattened, placed immediately under the sheath or membranous covering of a muscular fibre; it is called a "tactile corpuscle." This is the organ of touch, and is peculiarly sensitive at the tips of the fingers.

A spinal nerve is a compound or mixed nerve—that is, it is a nerve of sensation and motion. Physiologically a

nerve cord is found to consist of a bundle of fine fibres bound together by connective tissue and surrounded by a sheath. Some of these fibres convey sensation to the part which the nerve supplies, and others impart motion. For instance, if the posterior root were cut through, the muscles which are supplied by that particular spinal nerve would be entirely without sensation; if, however, the anterior root were destroyed, the muscle would be motionless. If both were injured or cut through, the muscles would be completely paralysed, without sensation and motion.

Nervous impulse or communicability is instantaneous; it is like the electric current which runs along a telegraphic wire, and brings the two ends, however remote from one another, into immediate communication. The passage of time that the nervous current takes to pass from the brain centre to a tactile corpuscle has been calculated to a fraction by physiologists.

What is understood by reflex action may be illustrated in the following manner. Supposing the finger is brought suddenly into contact with something very hot, the sensation of pain is no sooner experienced than the finger is withdrawn. What has happened? The sensory fibres of the nerve have transmitted the sensation of pain to the brain centres, where all impressions, both pleasurable and painful, have their origin. The brain has instantaneously sent down through the spinal cord a message to the motor fibres of the nerve, which, acting upon the muscle, has withdrawn the finger. The whole circuit has scarcely taken a fraction of time, but the action is reflex and not direct. Innumerable are the instances of reflex action. They can be studied with advantage,

although imperfectly, in the person under the influence of Alcohol. The movements become purely automatic, and are performed without the guidance or control of the higher centres. When the mouth waters at the sight of a cut lemou or by the smell of a savoury dish, the action is purely reflex. The optic or olfactory nerve has received the impression, and conducted it straight to the brain, which has stimulated the nerves supplying the salivary glands, and a stream of water rushes into the mouth.

Running through the centre of each of the fibres which compose a nerve cord, there is a hollow canal, called the axis cylinder, which contains fluid. The vibratory electric impulses from the brain to the terminal nerve-cells are supposed to travel along this medium. The structure of a spinal or mixed nerve is more complicated than that of an organic or sympathetic nerve fibre, but does not need exact description in this place.

I have presented the foregoing slight sketch of the cerebro-spinal system in order that the action of Alcohol upon this important structure should be better understood. It is almost impossible to convey a correct idea of the effects of certain agents upon the human system, unless there is some slight notion of physiological functious and structure. The brain, the most important organ of the body, the seat of the emotions, the will, the passions, the intelligence, of all human desires and feelings, of the highest as well as the basest of our propensities, is the organ the earliest and the most profoundly attacked by Alcohol. More spirit has been extracted from this organ after the death of an animal by Alcoholism, than from any other, excepting the liver, and we might almost say that there existed an "elective

affinity" between the two. The brain is enriched and kept healthy by the amount and condition of the blood which circulates through it, and by the vascular pia mater which invests it. When the blood is impoverished by poorness of living, by anæmia, by Alcohol, etc., then the brain, and through the brain, the entire cerebro-spinal system, suffers, and there is a universal weakening of the nervous and muscular power.

There is an intimate relation between the blood supply and the nervous system, the former acting as the physiological stimulant and regulator of the latter. Healthy blood, healthy brain, and *vice versâ*. So strongly has this fact impressed itself upon the minds of the medical faculty, that one of their number invented the phrase, "Neuralgia is the cry of the nerves for better blood," neuralgia being an acute or chronic inflammation of a nerve cord. It is because of the intimate relation which exists between blood and nerve, and because of their interdependency, that Alcohol acts almost directly upon nerve tissue, even in small doses. We notice its instantaneous effect upon the substance of the brain. The nerve-cells are stimulated into activity, impressions are excited, thoughts spring into existence, the tongue is loosened, words flow freely. As Dr. Richardson remarks in his Cantor Lectures, before the wine has circulated at a dinner party the guests are quiet, on their good behaviour in fact, and soon a progressive change is observed. "The face begins to get flushed, the eye brightens, and the murmur of conversation becomes loud." If the brain could be examined, even at this early stage, we should note the dilatation of the blood-vessels both of the pia mater, the two other membranes,

and the great and little brain, especially the cerebrum This is the initial stage of intoxication, or the stage of excitement.

The various degrees of intoxication have been roughly divided into three, although by exact observation of all the nervous and functional phenomena produced by Alcohol, they would be far more numerous. However, for all practical purposes the three stages (Dr. Richardson notes four stages) will answer very well, especially as there are distinctive features marking each. First, then, we note the general excitement, with its pleasant sensations. A sensation of *bien-être,* as the French say, of satisfaction with one's self and all the world; the mind unloosens itself, forgets for the moment the sorrowful side of life, is disposed to give and receive confidence; ideas flow freely, language becomes fluent, gestures are more frequent (and the English people naturally are apt to suppress this form of language) and assist the flowing speech; the eye shines, the pupil is more or less dilated, the complexion warms up, and many plain persons will look quite interesting and attractive in the first stage of alcoholic influence. The locked chambers in the mind of the reserved and concentrated person will be opened to a small extent, those of the candid and straightforward person will be thrown open to let all the world enter, and read the secrets thereof. The ostentatious individual will boast, the clever man display his learning, the talker will monopolise conversation, the thinker will want to talk. Many other characteristics will be displayed, which in the perfectly unexcited state are retained in check. There are periods in the lives of the most temperate men, of total abstainers even,

when the brain becomes stimulated into greater activity, and when all the phenomena mentioned above may happen to a greater or less degree; but I am inclined to think that in the latter case, the higher centres always exercise their controlling influence, and always keep a restraining check upon any unbridled form of emotion. The degree of excitement is less, and instead of being produced by a poisonous agent, is produced by a natural healthy excitement, by sudden pleasure and joy, which when it has worn off does not leave such a depressing effect as that experienced after even small doses of Alcohol.

Later, or during the second stage of intoxication, the phenomena become more marked, and we also witness the addition of others. Ideas are no longer consecutive; they become confused and incoherent. The nerves of the tongue and larynx are almost the earliest affected to any appreciable extent, and the utterance becomes thick and troubled. Hiccoughing very often supervenes at this stage, showing want of control over the expiratory efforts of the lungs. The lower lip bags, that is, it has a puffy and swollen appearance, and is tremulous. The conjunctivæ of the eyes are congested; the glance is either indistinct and wavering, or endeavours to assume a very piercing and defiant regard. The eyelids are swollen. The face begins to look puffed; the hands are no longer certain in their movements. As long as the person is seated, no alteration is witnessed in the gait, although the trunk may not have such an upright position as before, and is seen to lean slightly forwards or backwards. On standing, the body sways to and fro, the step is uncertain and trembling,—in fact, strange as

it may seem (on account of the greater distance of the brain from the lower limbs), the legs are almost the first to be affected in the different stages of intoxication. Muscular control is entirely lost over them a little later on. However well an intoxicated person at this stage may be able to control his speech, his looks, and the movements of his hands, his legs betray him, and are a certain indication of his alcoholic state.

The third stage is marked by very varied phenomena, according to the age, constitution, disposition, and character of the person affected. If the victim be quite a young man, who has become intoxicated for the first or second time, nature will be kind, and try to help the system by throwing off the poison. By reflex action the stomach vomits its contents, and that portion of the Alcohol which has not been absorbed is thus got rid of, and the poisonous effects are soon mastered. But if the victim is an old stager, one whose tissues are accustomed to the poison, who has by daily use and habit conquered its active influence on the organism, the third stage shows itself in various ways. The head is affected, vertigo is experienced, the skin becomes pallid, and control is lost over the sphincter muscles. All sensibility is blunted; hearing and smell are modified, sometimes completely suspended, and paralysis of the tongue is quite established. Words cannot even be formed, much less uttered consecutively. There is complete unconsciousness in the higher centres, and vision is double. The muscular manifestations are as varied as they are eccentric and remarkable. Attempts at dancing and singing are often made, with the most ludicrous results, and often in this stage the lower man or woman is

uppermost. Base instincts are yielded to, the passions ride triumphant over the reason; no four-footed animal is capable of showing such degraded tendencies, and such an utter want of decency, or committing such unnameable offences as man in a state of intoxication. He is lower than the beast; he can be compared with nothing in the animated world but a loathsome object, deserving only the censure, and sometimes the pity, of his sober fellow-creatures. Truly it is a sight to make the angels weep, a man who has lost control of that supreme and divine reason which God has given him to guide and control him through "a naughty world."

The skin loses all sensibility, and as the action of the poison continues to take effect, the breathing becomes stertorous, the face livid, the eyes suffused and sightless, the teeth gnash together, and there is foaming at the mouth; the circulation is very feeble, as the condition of the pulse will show. The heart is laboured and intermittent; the temperature at this stage is much below normal. If the individual thus affected be placed in a warm bed and allowed to remain quiet, he will gradually sink into a deep but troubled sleep; and if his constitution is a strong one, and he is not a chronic drinker, he will gradually recover in from twenty-four to forty-eight hours, but the other effects will persist for some time, as if he were recovering from an acute illness. He will complain of splitting headache, dimness of vision, loathing for food, although craving for something to eat, and pains in the stomach and limbs. Thirst will be excessive, tongue parched, and covered in a thick yellow fur, and breath very offensive. The conjunctivæ will have a yellow coloration, the skin a sallow

and unhealthy appearance, the movements of the limbs will be uncertain and feeble.

In the stage of intoxication just described, many accidents may happen without the knowledge of the individual affected. Serious operations have been performed on drunkards without the administration of anæsthetics, Alcohol having efficiently blunted every sensibility. Dr. Percy relates a case in which the reduction of a shoulder joint, that had resisted all former efforts, was successfully effected under the influence of alcoholic insensibility. A French doctor, Blandin, amputated the thigh of a man who was found dead-drunk in the street, and who had no idea, until afterwards, that the operation had been performed. Another case is related of a woman who was confined of a child whilst under the influence of Alcohol, and who, when she returned to consciousness, congratulated herself on the easy way she had discovered of avoiding the pangs of childbirth.[1] Even the most superficial observer must have been struck with the apparent immunity of the drunkard from the results of his condition. He falls, but does not seem to hurt himself; he strikes with violence against brick walls, but does not feel the concussion; he wounds and bruises and injures himself in a variety of ways, but seems to bear a charmed life through it all. Dr. Lauder Brunton relates the story of a man who, while drunk, threw himself over the Dean Bridge in Edinburgh, a height of about 200 feet, on to the rocky bed of the stream below. He says: "A sober man would probably have been instantly killed, but this

[1] These cases are given by Messrs. Lallemand, Perrin, and Duroy in their work already referred to.

individual, though he had broken both of his thigh-bones, quickly recovered; and I saw him a few weeks afterwards hopping about briskly on crutches, the legs being nearly, though not entirely well." Dr. Brunton, in explanation of this pecular immunity which drunken people seem to enjoy from terrible accidents, says: "The reason of this immunity probably is that the nerve centres which regulate the heart and vessels are so much paralysed in the drunken man as not to be affected by the shock of the fall, which in a sober man would have acted on them so violently as to stop the heart, arrest the circulation, and cause instant death." There is no doubt that this is the physiological explanation of the peculiarity. We know how sudden fear, without any aid from Alcohol, will arrest the heart's beat, and blanch the surface of the body. In a sober man this mental disturbance acting on the nervous system in addition to a physical shock (such as that of falling from an unseen precipice, or confronting sudden danger from which there is no escape) will often put an end to life instantaneously, when the drunken man will escape, because his nervous system is completely blunted to all sensations.

It is also during this stage of what Dr. Richardson calls "a stage of unbalanced reasoning power and volition" that crimes are often committed without the consciousness of the individual. Child-murder, wife-beating, parricide, incendiarism, and attempted suicide, are amongst the long list of horrors of which Alcohol is nearly the sole origin, and in the police courts we see drunkenness nearly always alleged as an extenuation of and as an apology for the crime. As if the bestial condition which had culminated in the crime were not an additional offence,

instead of an extenuating circumstance. Until our legislators acknowledge this fact and punish drunkenness as they do any other criminal act, wife-beating, child-killing, and other crimes will continue to exist and to mock our vaunted civilization.

When the nervous system has been for years subjected to the poisonous influence of Alcohol, the third stage of intoxication often develops the *mania e potu*, or delirium tremens, in which the mind is completely destroyed for the time being. There is scarcely any condition of insanity which exhibits such an awful picture as this. The most loathsome objects are felt and seen by the miserable victim, and the Inferno of Dante is lived through and intensified a thousand-fold. If the brain and spinal cord are examined after death, which not unfrequently occurs in delirium tremens, their membranes, especially the pia mater of the brain, are found engorged with blood, and the ventricles of the brain (two shallow cavities, one in the centre of each hemisphere) contain fluid, which not only smells of Alcohol spirit, but will burn with a blue flame when a light is applied, and will give the characteristic reactions of Alcohol. Agstin performed an autopsy on a woman who, in a state of Alcoholic mania, committed suicide by drowning. He found no less than four ounces of fluid in the ventricles of the brain, which, according to him, presented all the physical characteristics of Alcohol. The blood-vessels of the substance of the brain are also dilated and engorged, and in some instances hæmorrhage from bursting of a blood-vessel has occurred. Effusions of blood in the membranes and substance of the brain are frequently found in autopsies where death has been caused by drink.

Joseph Frank gives a very concise but complete account of the different stages of intoxication, which I translate liberally. He says: "In the first period of intoxication we observe mental excitement, rapidity of thought, fulness of the heart, brightness of the eyes, garrulous tongue, flushing of the skin, increased perspiration, with frequent desire to micturate, memory uncertain, pulse strong and full. But later on there are great giddiness, with singing in the ears, duplex vision, absence of consecutive ideas, loss of control over the will, and disorderly movements occurring one after another. The manners and nature of a person begin to show themselves more explicitly, all disguise is withdrawn, for there is truth in the dictum '*in vino veritas*'; he burns with passion and becomes violent, or sighs for the society of his sweetheart whom he wishes to embrace; he bursts forth into loud and foolish laughter, and is very generous all at once, or he sheds tears of sadness and speaks of religion and death. He stumbles over slight obstacles in his way, and finally exhausts his strength; he begins to stammer in his speech, his face becomes pale, he vomits thick sputum, the sphincter muscles are relaxed. There are trembling of the limbs and shaking of the whole body, followed by awful scenes and convulsions, and terminated by apoplexy or death." [1]

From the first to the last dose Alcohol acts more or less as a poison on the nervous system. Nature warns us of the fact when she forcibly rejects the poison from the stomach of young people who partake of Alcohol too

[1] Joseph Frank: "De Ebrietate," p. 292.

freely for the first time, and who may have been total abstainers till then. In the great number of instances, experience, unfortunately, teaches no lesson. The natural antagonism of the nervous system and the stomach towards Alcohol has to be resisted and overcome, the frame has to be brought into some kind of a relationship with Alcohol; therefore, the habit is persisted in. What actually occurs in the nervous system by the continued use of Alcohol, I do not think has been yet investigated. We know of the actual changes which take place in the blood, the blood-vessels, the stomach, the liver, and other parts,—changes which have been referred to; of those which occur in the nervous system we seem to know but very little. It would be an interesting study to pursue, and a most interesting important scientific fact to discover, what species of degeneration the brain-cells and fibres of the white and grey substances undergo, whether it is a transitory or permanent change, and whether after such structural degeneration the fibres and cells are rapidly or slowly renewed. Also what changes occur in the nerve cord, whether the axis cylinder is the part attacked by Alcohol, thus modifying electric transmission of nervous force, or whether the nerve structures surrounding the axis cylinder are the parts affected. Also what modification the tactile corpuscles (in which the sense of touch is seated) undergo, since we know that their sensibility is very gravely impaired both in the acute and chronic condition of alcoholism.[1] The physiology and pathology of the nervous system with

[1] It is possible that the nerve lesion is only secondary to the primary changes occurring in the blood and blood-vessels.

regard to Alcohol have yet to be investigated, and will open up new lights on the question of heredity and insanity, and other nervous diseases, which will be of paramount importance to the physician and the scientist.

The last word has by no means been spoken about the action of Alcohol upon the human system. Its manifestations are so various, its mode of working in each individual so different, its hereditary influence so subtle and complicated, that a century devoted to its study would scarcely suffice to bring the flood of light upon it which the whole subject requires. But it will be done, and all the more honour and credit will be due to those who began the almost superhuman task of drawing swords against one of the most gigantic prejudices the world has ever cherished.

Upon muscle, both voluntary and involuntary, there is no doubt that Alcohol exercises a decidedly deteriorating effect, which is probably secondary to the changes occurring in the nerves and blood which supply the muscular system. A muscle is composed of innumerable long fibres, running parallel to one another, and bound together by connective tissue into small bundles. "These bundles are united together into larger bundles, and these into one aggregate, by connective tissue, which supports the vessels and nerves of the muscles and usually forms at one or both ends of the muscle a tendon."[1] Each ultimate microscopic fibre is enveloped in a sheath, an elastic transparent membrane, called the sarcolemma. In the muscular fibres of the heart there is no sarcolemma. The important and distinctive difference

[1] Huxley's "Elementary Lessons in Physiology."

between voluntary and involuntary muscular fibre is that the former is seen to consist of transverse striations, composed of extremely minute discs, and the latter has no transverse striations. During life, muscle has a clear and semi-transparent appearance, and its red colour is due to the amount of blood contained in it. The substance of which muscle is mainly composed is called syntonin, a gelatinous proteid material of which very little is known. It is possible that Alcohol exercises an injurious effect upon the syntonin of muscle, by coagulating it, in the same way that it coagulates the albumen of other parts. The capillary system of blood-vessels forms a complete and close network in the muscular system, and it is here that the processes of oxidation are conducted most actively, on account of the contractile power of muscle. As we have seen, Alcohol is capable, through its presence in the blood, of preventing or retarding the processes of oxidation; thus effete products are retained in the muscles which the blood ought to carry away. It is quite possible that Alcohol, in its circulation through the capillary system, should exercise an injurious effect upon those parts in close contact with the vessels, the walls of which are so fine and delicate, that fluids and gases, as we have seen, can pass from within to the outside, and *vice versâ*. When natural processes are interfered with in the tissues, a little fatty deposit takes place, which gradually accumulates, and the muscular substance very often becomes loaded with it. In the heart this frequently occurs from the effects of Alcohol upon its muscular structure. Dr. Richardson says in his Cantor Lectures: "Again, the muscular structure of the heart fails, owing to degenerative changes in its tissue. The

elements of the muscular fibre are replaced by fatty cells; or if not so replaced, are themselves transferred into a modified muscular texture, in which the power of contraction is greatly reduced." It can easily be seen that if the principal constituent of muscle is acted upon by Alcohol, and if natural processes are interfered with, and nutrition prevented, that muscular structure will gradually become abnormal, and will be incapable of performing its function of contracting. Thus in time a kind of paralysis will occur, which, in the last chapter, we have seen actually does take place.

Although Alcohol has been found in the thoracic duct (a large vessel communicating with the lacteals of the intestines, and containing the lymph, which it pours into a vein situated under the left clavicle), I do not think it has yet been demonstrated to what extent the lymphatic system is affected injuriously by this agent. Due importance is rarely given to the peculiar functions of the lymphatic system, for, physiologically, less has been discovered and made clear about it than about any other part of the human frame. This system is composed of an immense number of vessels, ramifying in every part of the body like the blood-vessels. The lymphatics originate in the lacteals of the intestines, and the contents of the lacteals, the chyle, are poured into them. After circulating through the whole of the lymphatic system, the chyle, or lymph as it is then called, is poured into the thoracic duct, and thence into the blood of the veins.

As the largest proportion of the Alcohol ingested is absorbed by the blood-vessels of the stomach, it is uncertain whether any of it enters the lacteals with the chyle

in the intestines. In order to ascertain its presence in the lymph, it would be necessary to examine that fluid after death had taken place from Alcohol poisoning. Whether it exercises any deteriorating effects upon the lymph itself, or the vessels which contain it, are points that at present need more elucidation; but we may suppose that some change is effected, since it is quite evident that Alcohol is a destroying agent whenever it comes into contact with living animal tissue. The presence of the greasy globules in the blood, which are found in that fluid when Alcohol has been largely ingested, may be due to the action of Alcohol upon the lymph, preventing its proper assimilation and complete mixture with the blood; but this is only theory, and not ascertained fact. There may be no relation whatever between the fatty globules in alcoholized blood and the lymphatic system.

Upon the membranous textures of the body, wherever they are situated, Alcohol exercises its most powerful effects. All the tissues, structures, and organs of the human frame are invested by and built upon membranes of different kinds, according to the parts in which they are situated. We have already noted some of them, such as the mucous membrane, lining the whole of the alimentary tract from the mouth to the rectum, the membranes of the brain and spinal cord, those which invest the muscle and the muscular fibres, which surround the lungs (the pleuræ), the heart (the pericardium), the liver, intestines, and other organs contained in the abdomen (the peritoneum), and covering closely the bone (periosteum). They tend to keep the various parts in position, to protect them, and to nourish them. Dr. Richardson says of these membranous tissues, which are thick, thin, or dia-

phanous, according to the parts they occupy, and the purpose they fulfil in those parts: "The membranes are filters of the body. In their absence there could be no building of structure, no solidification of tissue, no organic mechanism. Passive themselves, they nevertheless separate all structures into their respective positions and adaptations."[1] And again: "Upon the membranes, in their integrity, all the silent work of the building up of the body depends. If they are rendered too porous, and let out the colloidal (gelatinous) fluids of the blood—the albumen, for example—the body dies—dies as if it were slowly bled to death. If, on the contrary, they become condensed and thickened, or loaded with foreign material, then they fail to allow the natural fluids to pass through them. . . . Upon all these membranous structures Alcohol exerts a direct perverting power of action. It produces in them a thickening, a shrinking, and an inactivity, that reduces their functional power."[2] The membranous tissues contain a large quantity of water; in fact, their functions could not be properly performed without the presence of water. The peculiar property of Alcohol, which has been referred to several times, is to seize hold of water wherever and whenever it comes into contact with that element, and thus the membranes are deprived of their most important constituent, and their power of dialysis, or filtrating power, is thereby impaired, and later on completely destroyed. These changes are seen by the action of Alcohol upon the membranes of the brain, the stomach, the liver, and the kidneys. In all these instances the membrane is thickened and hardened,

[1] "Diseases of Modern Life." By Dr. Richardson, F.R.S.
[2] Idem.

and the functions of the several organs are seriously interfered with. The changes occurring in the lining membrane of the stomach and brain have already been described; those taking place in the liver and kidneys are somewhat different.

There is scarcely any organ in the body which is so directly influenced by Alcohol as the liver. It exercises an unfortunate rivality with the brain in this respect. The liver has an exceptionally rich supply of blood; it receives blood, full of nourishment, through its portal system, which is made up of vessels from the intestines, stomach, and other organs of the abdomen; it also receives blood direct from the aorta through the hepatic artery. The portal vessels and the hepatic artery enter the liver together, distribute branches together, and ultimately end in minute vessels which surround the liver cells where the bile is manufactured. The blood circulating in the liver has a higher temperature than that of any other part of the body, and is richer in sugar. In fact, the liver is a kind of storehouse for sugar, and the blood withdraws it for the nutrition and warmth of the body when the latter requires it.

When Alcohol, or the beverages containing Alcohol, are absorbed by the blood-vessels of the stomach, they are carried at once through the portal system of the liver before entering the general circulation. In this way the organ becomes surcharged with fluid, which by pressure on the liver cells gradually modifies their secreting function. The Alcohol in time exercises its pernicious influence upon the membrane—the connective tissues—of the liver, which becomes thickened. This thickening is probably due to the Alcohol coagulating

the colloidal matter of membranous tissue, for there is not a tissue of the body which does not contain this gelatinous, albuminoid, or protoplasmic substance, which, like the white of egg, is easily coagulated by water at the boiling point or Alcohol. The thickening of the membranes which surround all the minute and delicate cells of the liver, and the extra amount of fluid poured into the organ, increase its size at first, but later on the connective tissue gradually shrinks around the lobules and cells of the liver, until they are squeezed up and rendered useless. Very often this organ has been reduced two-thirds of its original size by the thickening of its membranes, and by the gradual shrinking away and destruction of the cellular substance of the liver. Alcohol also aids in the deposit of fatty tissue in this organ, which undergoes the change known as fatty degeneration.[1] Disease of the liver interferes with its peculiar function of creating and storing up sugar which circulates in the blood, and is finally discharged from the body through the kidneys. The large amount of sugar found in the blood is extremely injurious to health, and in the majority of cases ends fatally.

[1] Dr. Peters, of New York, in the *New York Journal of Medicine*, vol. iii., has examined the condition of the liver in seventy drinkers of rum and brandy. "In moderate drinkers, the liver was larger than normal, and its surface was infiltrated with fatty globules two to three lines in thickness. In those who had drunk more freely of spirituous liquors, the liver was much larger still, its borders thick, and the deposits of fat on the surface more numerous and extensive. In habitual drunkards the liver was large, weighing at least six or eight pounds, often ten or twelve; the borders were very thick and rounded; the connective tissue white with fat, soft and friable, the membrane (peritoneum) covering it could be easily torn away."

The kidneys are acted upon in much the same way as the liver. There is a gradual thickening of the membranes, a deposit of fatty tissue, structural degeneration, and functional disturbance. The kidneys have a beautiful arrangement of tubes and glomeruli, in the latter of which urea, uric acid, certain salts, and carbonic acid and water are excreted from the blood which flows through their minute capillaries. Each glomerulus (only visible under the high power of a microscope) is surrounded by a delicate and fine membrane, and consists of a small knot of capillary vessels. The blood, whilst circulating through this knot of minute vessels, gives up the constituents of the urinary secretion, which is carried away by a minute tubule projecting from the membrane and communicating with the other tubules lying parallel with one another in the substance of the kidney. The secretion, after finding its way down these tubes, gradually collects in a receptacle of the kidney, called the pelvis, from which it gently flows down the ureters into the bladder. There is scarcely any organ in the human body which is so beautiful, microscopically, as the kidney. It has only been possible here to give a very short description of its exquisite structure, but a more interesting and fascinating study, from the point of view of physiology and histology, cannot well be conceived.

The Malphigian capsule (the membrane which surrounds the glomerulus or tuft of capillary vessels) takes up the urinary secretion from the blood as it circulates through the glomerulus and passes it along to the tubules; if the equilibrium between these two structures becomes unstable through degeneration of tissue, the blood allows more of its constituents to filter through the membrane

than is normal, and thus a diseased condition of things results. Alcohol is one of the most powerful agents in destroying this equilibrium. The epithelial cells lining the Malphigian capsule and tubules gradually lose their vitality under the influence of this irritant poison, and are not able to reproduce themselves so easily and so effectually. The consequence is that the capsule, and tubules, leading from the capsules to the pelvis of the kidneys, become choked up with epithelial cells and other effete *débris*, which are carried away eventually through the urinary secretion. On examination of a drop of such urine under the microscope, it will be found crowded with cellular products and organic *débris*, and will clearly point to the serious amount of degeneration and destruction of tissue which is taking place in the most important parts of the kidney.

Through this degeneration of the Malphigian capsule, and probably of the membranous structure which forms the walls of the capillary vessels, the blood loses more than the urea, uric acid, water, and salts which form the urine. It loses one of its most important parts, the albumen, the albuminous constituents of the blood being those which build up the various tissues and structures of the body. Dr. Richardson says: "For this colloidal albumen is the primitively dissolved fluid out of which all the other tissues are, by dialytical processes, to be elaborated. In its natural destination it has to pass into and constitute every colloidal part." [1] It can easily be seen that if the blood loses, in its passage

[1] Cantor Lectures, by Dr. B. W. Richardson.

through the kidneys, this important element, the rest of the body is bound to suffer. This actually takes place, and people who have diseased kidneys, as we have seen in the preceding chapter, are afflicted in a variety of ways from poorness of blood. The albumen of the blood which is thus allowed to pass through the diseased membranes of the kidney can be found in the urine sometimes in large quantities. On boiling a portion of the urine in a test tube over a spirit lamp, the albumen will coagulate, and will be seen floating in the fluid, in thick flocculent deposits.

In addition to the cellular structure of the kidneys becoming destroyed, and the albumen of the blood passing away in the urine, the urea and uric acid, instead of being excreted, as in the normal state, are often retained in the blood, and give rise to various alarming symptoms. Thus the whole exquisite machinery of the kidney, which naturally should rid the body of several of its waste products, both organic and inorganic, can be completely destroyed through the influence of Alcohol upon its structure. The kidney may also, very similarly to the liver, undergo fatty degeneration, and then the organ becomes much larger, presents a white, fatty, unhealthy appearance, and is easily broken down under the touch. It is difficult to account for the fatty deposits in the liver and kidneys, and other parts of the body, but it is possibly due to the mal-nutrition, to the retention of waste products in various parts, owing to the imperfect oxidation of the tissues, and to the sluggish and ofttimes abnormal performance of the various functions of the organs. Fat globules are developed in the blood of those who indulge largely in Alcohol; these

may be deposited in the different tissues as the blood circulates through them.

As another result of alcoholic degeneration, the kidney very often goes through the three stages that the liver does : (1) increase of size owing to the vessels carrying an abnormal amount of fluid, and a thickening of the membranes of the kidneys ; (2) a still further increase of these conditions ; (3) hardening and shrinking of the membranes and pressure upon the blood-vessels and tissues, until the organ is often reduced to much below its normal size.

The skin, the secreting structure of the perspirations (which is composed of water, salts, and a minute proportion of CO_2), is more or less affected by the use of Alcohol. The skin acts towards the blood in much the same way as the kidneys, as a sort of filter through which the blood gets rid of water and certain salts. In the dermis (the fleshy vascular tissue, lying immediately beneath the epidermis, or scarf skin) are innumerable small canals, leading down into the sweat-glands. These small canals at their other extremity penetrate the epidermis, and have their openings on its surface. The glands are surrounded by a network of capillary vessels, and as the blood circulates through them, the constituents of the perspiration pass from the vessels into the glands, thence through the canals, and on to the surface of the epidermis. The capillary vessels of the dermis are under the control of the sympathetic nervous system, and their calibre is affected by many external agents primarily affecting the nerves which supply them.

Fear will contract the vessels of the skin, and it will become blanched ; pleasure will enlarge them, and a blush

is produced. Under the influence of cold the calibre of the vessels is narrowed; under heat they are enlarged; but unless the heat or the cold is very intense, an equilibrium is established between the circulation and the tissues which prevents any injury being effected. In the case of Alcohol the sympathetic nervous system undergoes a slight condition of paralysis, the blood-vessels are relaxed, and a larger amount of blood is poured through them. When these conditions are being constantly renewed, the sweat-glands of the dermis become inactive, they no longer throw off the waste products of the blood, and the little canals become choked up with effete matters, fat, organic matter of different kinds, and other impurities. A greasy pallid condition of the skin is often seen as the result of alcoholic indulgences, due probably to some kind of fatty degeneration; and in other instances the minute venous radicles are permanently enlarged and inflamed, and show plainly their markings on the surface of the skin. When effete products are retained in the sweat-glands, a gradual degeneration of the structure of the dermis takes place, resulting in skin diseases of various kinds.

The membranes and tissues of the lungs are not unaffected by Alcohol, which acts upon the mucous membrane lining the bronchial tubes much in the same way as it acts upon membrane elsewhere. In this instance the action is less direct and less powerful, the Alcohol having first completed a good part of the circulation before it enters the lungs. It is an ascertained fact that a small proportion of Alcohol leaves the lungs in the breath, therefore its vapour must have passed through the delicate walls of the capillary vessels into the air-cells,

thence through the bronchial tubes to the windpipe. There is no doubt whatever that the capillary system becomes engorged as elsewhere with blood, under the influence of Alcohol, and the lungs are then more sensitive to changes in the atmosphere and to chills than they otherwise would be.

A very frequent occurrence in the lungs of alcoholic people is hæmorrhage from the bursting of a blood-vessel, also aneurism, a condition in which an artery has become very much enlarged at some particular spot, its muscular tissue having lost its resistance and elasticity. In both cases Alcohol has acted injuriously upon the muscular fibres of the blood-vessels, but in an almost opposite manner. It has either hardened them and made them brittle, or rendered them relaxed and unresisting. Either of these conditions is often seen in the blood-vessels of the brain of alcoholics, and the result is the same.

Up to the present it has not been ascertained, I believe, whether the organs known as the pancreas and spleen are affected to any extent by Alcohol. The former secretes the pancreatic juice, which acts upon the chyme in the small intestine, and the latter is supposed to be the grave of the red blood-corpuscles, and probably the birthplace of the white ones. The spleen often undergoes a process of fatty degeneration; but whether this has ever been associated with excessive indulgence in Alcohol, I am unable to say. It is difficult during life to ascertain the changes which exactly take place in these organs, on account of their obscure situation, and therefore diseases affecting them are not so readily diagnosed. The spleen is often very much enlarged, and not

unfrequently when the liver is enlarged by Alcohol or some other cause, as if there were some sympathetic connection between these two organs. The condition known as the "spleen" (intimating a sort of general *malaise*) is often associated with this organ, and it is quite probable that Alcohol in large doses sets up an irritation in its blood-vessels and structure, which brings about gradual changes affecting the functions of the organ.

There is not a tissue, structure, or organ of the body (excepting hard and resistant bone) which can be said to escape the injurious effects, direct or indirect, of Alcohol. Taken in sufficient quantities, it has a poisoning and deteriorating effect upon the solids, semi-solids, and fluids of the body. Its action, even in small doses, is perversive of natural normal function, and in health it upsets the stable equilibrium which should exist between the various tissues and structures of the body, and increases the evil according to the quality and quantity of the liquor taken. The delicate structure of the eye, its different membranes and nervous tissue, are also injuriously affected by the poisonous irritating effects of Alcohol, and the sense of sight is diminished. A fatty degeneration of the iris, called the *arcus senilis*, is often seen in the eyes of hard drinkers when the kidneys have undergone structural changes due to Alcohol.

The hair even does not escape, and a physician of the last century, Dr. Hales, in 1750 writes: "It is the well-known observation of the dealers in hair for wigs, that they can distinguish the dram-drinker's hair by the touch, finding it harsh and dead-ended and unfit for use. . . . It was also found that these pernicious drams

not only alter the quality, but also, by their drying and corrosive power, lessen the quantity of hair; and, what is a melancholy proof of the great prevalence of this wicked practice, there is now so much less hair to be bought among the lower people."[1] Although the condition of the hair among drinkers has not been much noticed of late, yet I dare say it would afford a very interesting study to the total-abstaining inquirer. The universal indulgence in alcoholic liquors may account for the number of bald heads we see, and for the premature decay of the hair. It is quite certain that the growth and condition of the hair are dependent on the richness of the blood supply and the general health. If the blood is impoverished through Alcohol, and the general health is impaired, the hair will suffer, will fall out, turn prematurely grey, and lose its soft and fine quality.

In its effects upon the human body we can truly say that Alcohol acts as a poison like opium, strychnine, or arsenic, etc. Viewing it in this light, and with perfect scientific justification, it should, in my opinion, be regarded in the same way and introduced into the Poisons Act, so that its purchase and sale should be on a very limited scale.

[1] "The Foundation of Death." By Mr. Axel Gustafson.

CHAPTER V.

ECONOMIC ASPECTS OF TEMPERANCE.

To the student of figures it must be apparent that an immense amount of money is shamefully and unjustifiably wasted every year in the United Kingdom on Alcohol. Nothing can be more ghastly than the huge array of figures set forth, and the sum total they represent. There is not a ratepayer in the country who does not unceasingly find fault with the abnormally high percentage that he has to pay on rates and taxes. It is one long complaint, and political parties are supposed to set the matter right when they come into office, each one undertaking and pledging itself to reduce the national expenditure; but nothing definite is ever done. The responsibility is shifted from the shoulders of one Government to the other, and the nation goes on patiently bearing its load of taxation. The truth of the whole matter is, that individual ratepayers either cannot find the time to investigate the question for themselves, or are not sufficiently educated to understand the meaning of figures, and thus the solution of the problem is left entirely in their representative's hands. They attend political meetings, and exact promises from members of Parliament to look into the matter of taxation, but be-

yond that, the great majority of them seem helpless and hopeless. Here again ignorance reigns supreme, and people continue to pay rates and taxes, scarcely knowing all the while for what they have to pay them. And there is no one to enlighten them, except a few statistical writers, who now and then contribute to high-class journals, but whose writings never penetrate to the great mass of those who require them. There is little or no education on the subject, and reform under such circumstances is absolutely impossible. A lively and general interest must first be awakened, and an intelligent understanding brought to bear upon the question of taxation, the national resources, the several causes of the increase and decrease in wealth, and all other matters concerned with the financial welfare of the nation. The intelligent and well-educated few do understand and appreciate these questions of paramount importance, but the great majority are absolutely ignorant. When there is a general cry of depression in trade, of large numbers of starving unemployed persons, of over-filled workhouses and infirmaries, are causes ever investigated and sought to be remedied? What physician who respects his art, and understands his calling, will treat his patient's symptoms without endeavouring to search for the cause and applying his remedies to that? And why should a different treatment be pursued with regard to national diseases? No tinkering of symptoms will ever effect a cure of such disorders: they must be treated upon scientific principles. The people should educate themselves to understand the causes of economic crises which occur every now and then to shake the foundation of law and order, and then they could better apply themselves to

the remedy. As it is, charity is called for, money is lavishly wasted, and at the end of a week or two everything is exactly the same as before, if not a little worse, because those who are suffering think it very hard to be suddenly deprived of assistance.

Let us see how the money of the country is wasted, and why a large number of its inhabitants are in a chronic condition of hopeless misery, destitution, and disease. It is the testimony of nearly every competent authority throughout the kingdom, that at least two-thirds of the existing pauperism is directly and indirectly due to drink. There is an average population of 820,000 paupers, male and female, in receipt of parish relief. Of these over 200,000 are in the workhouses, and over 600,000 receive out-door relief. This relief is administered at a cost to the ratepayers of £8,296,230, an average rate of 1*s.* 1½*d.* in the £. Every pauper costs on an average £10 12*s.* 6*d.* per head, and in the metropolis £22 5*s.* 2*d.* per head. This is only the actual cost of the pauper's maintenance, to which must be added the outlay of capital in the building and rental of all the numerous workhouses throughout the kingdom, the workhouse schools for the 269,000 pauper children, the workhouse infirmaries, and the parish burials. To keep this all going hundreds of persons have to be employed, at graduated salaries, to look after the conduct and welfare of these several establishments. The workhouses also deal in luxuries, for which the ratepayer's pocket has to suffer. The authorities do not like to deprive the poor man of his beer, although the beer has more often than not been the origin of his pauperism, and so they generously continue to provide him with the

liquor, which is paid for out of the struggling, honest, and respectable ratepayer's pocket at a cost of £44,800 per annum. In the year 1871 the total cost of intoxicants was £82,554, but temperance agitation has done that much good for the ratepayer—it has materially reduced this wasteful expenditure on a totally unnecessary and useless article. In London alone, the cost of intoxicants in the workhouses during the year 1886 was £16,098, about £44 every day. In two or three workhouses no alcoholic drinks are allowed at all; whilst in others, notably St. Pancras, there was an expenditure of £687.

Every poor-law guardian will admit that he has certain responsibilities towards the ratepayers, and that all unnecessary expenditure should be scrupulously avoided. But the ratepayers are lacking in vigilance, and thought for their own interests, in not more thoroughly investigating the question of rates. Those living in parishes where there is a large expenditure on intoxicating liquors in the workhouses, should consider it their duty to know why they should be made to pay for them when other parishes can do very well without them. Putting aside the question of the therapeutical use of Alcohol in the infirmaries, it should be determined whether those who have been brought to a condition of pauperism, too often through their own follies, thriftlessness, and intemperance, should be allowed the use of a beverage which cannot impart either strength or health, and only tends to keep up the appetite for it. Plain nourishing diet should be provided, but luxuries, and above all harmful luxuries, certainly should not be paid for out of the pockets of those who are thrifty, temperate, and strug-

gling. There are many causes of poverty, but of pauperism the principal cause, written in letters of fire, is drink.

Criminality is another element of heavy national expenditure, by which our civilization is disgraced. The nation has to keep up a number of expensive establishments, in which to lodge criminals who have been brought to these abodes through drink. The Rev. J. W. Horsley, late chaplain of Clerkenwell prison, says that 75 per cent. of crime is directly or indirectly attributable or due to intemperance, therefore the taxpayers of the nation can congratulate themselves upon the possession of still another luxury, the cost of which is defrayed out of their pockets. Many authorities give it as their opinion that 90 per cent. of the crime in this country is due to drink; and the Convocation of the province of York, in their report on intemperance, calls special attention to the matter in these words: "Many magistrates, governors of gaols, and chaplains of gaols, and superintendents of police, concur in stating that of those crimes which obtain public notice, from 85 to 90 per cent. are the direct result of drunkenness." And Judge Coleridge on more than one occasion emphatically expressed it as his opinion, that if England could be made a sober country, nine-tenths of the prisons could be closed.[1] According to the yearly Blue-book of judicial statistics, we find that for the year 1885 there was a daily population of 15,375 prisoners in the various gaols, at a cost of £23 2*s.* 11*d.* per head; and the convict prisons numbered a daily average of 8,339, at a cost of £35 19*s.* 3*d.* per head. During 1886 the convict prisons

[1] "The Drink Problem and its Solution." By David Lewes.

contained over 11,000 prisoners, under the supervision of 1,408 officers, and the cost for their support (both officers and prisoners) being £271,651. The inmates in reformatories were 1,269, with 20,254 children in industrial schools, at a combined cost of £328,393. Of criminal lunatics there were 983 in the different asylums, their cost being £30,119. The cost of the police is about £3,540,000, and this added to the foregoing statistics (for scarcely a quarter of the police would be required if it were not for drink), makes a grand total of nearly £5,000,000, which have to be provided by the taxpayers of this country.[1]

In addition to this direct expenditure by the ratepayers, the hospital accommodation of the country has to be taken into consideration. Charity is dealt out with no niggardly hand in keeping these institutions going, but it seems like sending good money after bad when we are given to understand, on first-rate authority, that seven-tenths of the diseases treated in the hospitals are due to drink. A very limited number of these institutions would be needed if alcoholic beverages were no longer in use amongst us, and the class by which hospitals are mostly in use would be able to pay for medical advice in proportion to their means, and would consider it a degradation to receive gratis the result of the knowledge which has cost so much money, time, brains, and hard work to obtain. In a self-respecting, thrifty, and temperate community the number of hospitals would be

[1] "In 1880 the amount paid for poor and police rates in the United Kingdom was £16,165,220, of which over £10,000,000 was paid in actual relief to the poor."—*Hoyle.*

limited, and those that existed would be self-supporting and not dependent on spasmodic charity.

Although of late years there has been an ever-increasing commercial and agricultural depression, and much suffering has resulted therefrom to a large section of the community, yet we do not find a corresponding decrease in the liquor traffic returns. In 1874 the gross proceeds to the imperial revenue from the liquor traffic amounted to £32,299,062; in the year ending March, 1887, we find that they were £29,354,193, a decrease during the thirteen years of nearly three millions of pounds. This decrease, though probably appreciable by the exchequer, is only equivalent to a decrease of 1*s.* 8*d.* per head of the population, the total expenditure on intoxicating liquors per head being £3 7*s.* 8*d.*, or, in every family of five, £16 18*s.* 6*d.* When we consider the thirty-two millions sterling which are swallowed up by the exchequer annually, it can readily be conceived how loath succeeding generations of politicians are to deal with liquor legislation. It is an easy way of raising revenue, and, moreover, a virtuous way. The Government show a due appreciation of the uneasy conscience of the community by taxing an article which is physically, morally, and mentally injurious to large numbers of the people. Would they not be driven to their wit's ends to know how to raise that £32,000,000 if there were no alcoholic beverages to tax? One thing is quite certain, that two-thirds of the money now expended in keeping up the vast army of officials who maintain order and administer the law, in establishing and supporting the numerous workhouses, infirmaries, prisons, police-stations, pauper lunatic asylums, industrial schools, reformatories, etc., would never be required in a temperate

country, and the revenue would be raised by taxing the luxuries of the rich a great deal more highly than at present. It seems a very disgraceful and discreditable thing that the government of a civilized and so-called Christian country is maintained through the vice, misery, degradation, and crime of a large part of the community. To a being from another sphere, who made this planet his study for a short time, the liquor traffic, and what it involves, would appear an incredible anomaly, a monstrous night-mare; and yet there are millions who stubbornly and wilfully shut their eyes to the facts which surround them on every side, and from which they have directly and indirectly to suffer.

The drink bill of the nation is a startling anomaly in our yearly expenditure. Nearly £123,000,000 were spent in 1886 upon intoxicating liquors alone, at a cost, as stated before, of £3 7*s.* 8*d.* per head of the population. If the total-abstaining portion of the community, amongst whom would be reckoned all the children, were deducted, the liquor bill per head of the drinking population would be considerably higher. In 1876 the country outdid itself with regard to its drink bill—it spent the enormous sum of £147,288,759 on intoxicating liquors, equivalent to £4 9*s.* per head of the population. Since then, owing either to depression in trade, or, we will hope, to the success of the temperance movement, a marked decrease has taken place; for, in proportion to the increase in population, the drink bill last year would have reached the enormous sum of over £161,600,000,[1] if a check from some direction or other had not been received.

[1] The Rev. Dawson Burns, D.D., F.S.S.

This sum is almost annually wasted; there is nothing to show for it but disease, crime, poverty, and premature death in a great number of cases. In no other trade is expenditure so useless to the consumer. When houses are built, furniture and clothes of all kinds are purchased, and bread and meat bought, there is an actual value for one's money; a large amount of labour has been employed in the making and distributing of these several articles, and the buyer and seller have both profited. But in the selling and purchasing of intoxicating drinks, only the few who are employed in their manufacture and sale benefit at all, and they only do so at a terrible cost. There are very few who recognise the close relationship between general depression in trade and the drink question. We often hear of the evil of over-production, of manufacturers' warehouses being over-stocked with produce for which there is no market. And then comes a terrible amount of misery. Manufacturers, unable to dispose of their goods, dismiss their hands or reduce their wages; sometimes are obliged to close their factories altogether until things look up again. But the breweries, distilleries, and public-houses flourish apace through all the commercial and industrial crises; no diminution in their incomes; no over-stocked cellars for the contents of which there is no demand; no dismissal of hands or reduction in wages; no closing up of the grog factories until trade looks up again! The drink trade is always looking up, is always flourishing, always fattening on the general destitution and despair, and yet cause and effect are never thought out by the large majority of the working classes, and every week in the United Kingdom three millions and a half are spent on

strong drink. If this amount of money were directed into the right channels, if all classes were to purchase the necessities of life, instead of an injurious and useless luxury like Alcohol, such an awful stagnation in trade as takes place every now and then in our midst would not be possible. Or, if the same money were saved, were invested instead of spent, in times of trade depression, due to economic causes impossible to enter upon here, the working classes would have something to fall back upon, would not be entirely dependent upon the more thoughtful section of the community, and would not be driven into the awful straits which often now confront them.

One has only to take the case of two workmen to illustrate exactly what happens. Each is married, and earning on an average thirty shillings a week. The one is a total abstainer, the other believes in his beer. The total abstainer manages to put by in the savings bank the amount of money that the other spends upon beer, which we will put at the moderate amount of 3*s.* 6*d.* per week, sixpence a day. At the end of the year the former has, at the rate of 3 per cent. interest, the sum of £9 7*s.* 6*d.* in the bank, and at the end of ten years, if accident or illness has not obliged him to break into his store, a sum of £93 10*s.*, which with compound interest would bring it near £100, a nice little sum to invest in the purchase of a house or business, which carries him up in the world. No longer a workman, he is a capitalist at the end of ten short years, and, through his foresight and industry, can carry his head amongst the highest. But where is the beer-drinker? He may not have become a drunkard by any means; he may be

looked upon by his employers and relatives as a model workman, a sober, respectable man, but at the end of ten years he has no money saved, not a farthing to lay his hands on, and is dependent entirely upon his health and strength. If they give way, or if he is thrown out of work, he is done for, unless he belongs to some benefit society. But there is nothing to prevent the total abstainer from belonging to a benefit society as well as the drinker; and, if of a thrifty turn of mind, he will insure himself against the accidents of life in this way, and will not have to touch his little hoard. The beer-drinker's health will not be, on the whole, so stable as the total abstainer's after ten years' indulgence, and his prospect in life will certainly not be so flourishing. All total abstainers are not thrifty, and do not save the money that would otherwise be spent upon beer; but total abstinence does tend to develop the virtues of thrift, foresight, and economy. A man once died in the greatest destitution and misery, and his last words were, "Where is all that money I saved from becoming a total abstainer?" Total abstinence does not always bring with it all the other virtues, it only gives them a better chance of springing into existence. In the case of the beer-drinker and the total abstainer the chance is that the former may fall into drunken habits, through always indulging in a tempting and seductive article, and thus ruin is brought upon himself and family, and the country has to bear the burden of supporting them. This burden comes out of the ratepayers' pockets.

In the employment of labour, another serious aspect of the question is brought under our notice. In no other industry are so few hands employed as in the manufac-

ture of drink. If the working classes would only be brought to see it, they would acknowledge that the breweries and distilleries are their greatest enemies, as immense fortunes are made by a few individuals from the employment of very little labour. Mr. D. Lewis illustrates this in the case of Scotland, where he says that at the various distilleries throughout the country (of which there are 118) the men employed in the manufacture of whisky number about 600. "Assuming 18*s*. as the average price per gallon paid by the customer, the sum expended upon whisky would amount to £7,277,761. Were this sum diverted into channels of legitimate industry, no less than 50 per cent., or one-half of the above sum, would find its way into the labour market, and would thus employ no fewer than 46,395 workmen at an average wage of 30*s*. per week." [1] Such significant facts as these ought surely to be placed before every working man throughout the country, so that he may judge for himself (and I think his good sense would conquer) how far he would support an industry which is suicidal to his highest interests. But the working classes are not enlightened on these matters, and lecturers on political economy and temperance reform do not sufficiently weigh these arguments for the benefit of their hearers.

The late Mr. Hoyle, in his elaborate statistics on the subject, has pointed out again and again with the most unwearying patience and earnest eloquence this particular aspect of the question. He has shown that the country gains nothing, that general commerce is not benefited, that the working classes are always "kept

[1] "The Drink Problem and its Solution." By David Lewis, J.P.

under" by the drink trade. In illustration of the wasteful aud utterly useless expenditure on Alcohol in connection with trade depression, he points out that the gross rental of all the houses in the United Kingdom is about £75,000,000, and the gross rental of agricultural lands (taking 1878 as an average) is about £60,000,000. The figures added together come to £135,000,000. "As I have before stated, even without the brewers' corrections, our drink expeuditure during the last ten years has averaged £136,500,000 yearly, or £1,500,000 more than the rental of all the houses and land in the United Kingdom."[1] Mr. Hoyle, in commenting on these figures, says: "What an outcry there has lately been that a reduction of rents is needed to secure a restoration of our prosperity!

"I would ask the reader to consider the question, if such a reduction of rents will insure the prosperity spoken of, what would be the financial prosperity that would result from the saving of an amount greater than the sum total of all our rents, both of land and houses? And let it not be forgotten, we should not only save the £136,500,000, but we should further save to the country the indirect losses which our drinking customs impose, and which are themselves nearly double the rent-roll of all our farming land. What a miue of wealth we should have at command within our own borders if we only acted with a view to the nation's well-being!"

There is an appalling waste of food in connection with the drink question, which must not be lost sight of. Little children, guiltless of sin, are crying for bread; and

[1] "Our National Drink Bill." By William Hoyle.

yet every year we spend nearly double upon intoxicating liquors that we do upon the staff of life. We destroy and ruin the grain in the manufacture of beer to the extent of 81,512,657 bushels yearly. "A bushel of malt is equal to a bushel of barley, which weighs 53 lbs. and will give 40 lbs. of flour, which will make 60 lbs. of bread or fifteen 4-lb. loaves per bushel, making a grand total of grain or produce destroyed exceeding 1,200,000,000 loaves, each weighing 4 lbs., or over 170 loaves per annum for every family in the United Kingdom."[1] This terrible destruction of grain takes place in the manufacture of a wholly useless and unnecessary article, whilst that which can give life and strength and health is sacrificed to the sovereign claims of beer. As Canon Farrar has pointed out in his "Claims on the Educated Classes," if the vast amount of money that is now wasted on intoxicating beverages were spent in fireworks, it would do far less harm to the individual and injury to the nation than in the former case. And it is scarcely gratifying, one would think, for the customer to know that in a gallon of ale, which costs two shillings, there is only one pennyworth of barley to be found, and it is therefore far less nourishing and strengthening than a penny loaf. The best part about these drinks is doubtless the water they contain.

The indirect loss to the nation through the drink traffic is about equivalent to its direct loss, and, according to Mr. Hoyle, averages about £138,000,000. He has calculated that about £50,000,000 are due to loss of labour and time to employers and workmen through drinking; this

[1] Hoyle.

estimate was obtained by the Parliamentary Committee of 1834, who came to the conclusion that one-sixth of the wealth produced was lost in this way. The annual wealth-produce of this country is about £480,000,000, so that Mr. Hoyle gives much under than over the estimate of the Parliamentary Committee. In addition, £5,000,000 are lost by destruction of property by sea and land, loss of property by thefts, and the cost of bankruptcies, the result of drinking; £20,000,000 are lost in public and private charges for crime, pauperism, destitution, sickness, insanity, and premature deaths, all the result of drink; another £28,000,000 are due to loss of wealth arising from the idleness of paupers, criminals, vagrants, lunatics, etc., numbering in all about 1,400,000 persons, of whom one-half might work and produce £40 each yearly; £20,000,000 are lost through the non-productiveness of the capital spent on drink and of that employed in the drink trade, which if spent in a legitimate way would in a few years accumulate and realize this vast sum; £15,000,000 are loss of wealth arising from the unproductive employment of judges, magistrates, lawyers, witnesses, policemen, gaolers, poor-law guardians, clerks, rate-collectors, etc., whose time is now employed through the drink; and in addition there is the loss arising through the extra cost of religious, moral, temperance and other social efforts and expenses needed to counteract the evils of intemperance. All these sums together make a total of £138,000,000, which if added to the average of £125,000,000 now spent annually on drink, make the enormous sum of £263,000,000. In ten years this sum would reach £2,263,000,000, nearly three times the amount of our national debt. And yet with such an easy

means within our power of freeing the nation of debt, we still continue to bear the burden of an excessive taxation, which tells so terribly on a certain section of the community. We cannot be surprised, with such an array of figures before us, that such evils as long hours of work, underpaid labour, the sweating system, excessive competition, over-production, strikes, and general discontent amongst the working classes, should exist in the economic world. But there are legislators who know these facts, who have studied them, and yet remain silent, either because a cowardly feeling possesses them, or they shrink from making themselves unpopular to the party to which they belong, or that they deem the matter so enormous in its magnitude that their individual efforts would be as nought, and they give up in despair and lapse into indifference. We look for a different morality from the temperance party, and it is to this party we turn as the Israelites of old turned to Moses, to save us from our present demoralizing circumstances, and to make visible to us another land of promise.

In conclusion, nothing can better demonstrate the superiority of total abstinence over even moderate drinking (which is called temperance) than the mortality returns of various insurance companies. It is now indisputably proved that the lives of total abstainers are 26½ per cent. better than those of moderate drinkers. In some insurance offices an immediate reduction on a premium of £100 (equivalent to from £5 to £8) is made on the lives of total abstainers because of their mortality being much less than that of the moderate drinkers. For instance, in the Sceptre Life Insurance Association we find that for the six years ended December 31st,

1881, the expected claims in the general section were 373, and the actual claims 287, or 77 per cent. of the expectancy; whilst in the *temperance* section the expected claims were 130, the actual claims 64, or only 46 per cent. of the expectancy. In this instance the abstainers' lives were 31 per cent. better than the moderate drinkers.[1]

The Temperance and General Provident Institution have also the two sections, and for the sixteen years ending 1881 the expected deaths in the general section were 4,080, the actual deaths 4,044, yielding 99 per cent.; whilst in the temperance section the expected deaths were 2,418, the actual deaths 1,704, being only 70 per cent., a difference of 29 per cent. between abstaining and non-abstaining lives.

The following from the Whittington Life Assurance Company is very significant. The company kept a separate account for those who abstained totally from intoxicating liquors, and those who did not. In the former section, the death-rate was only 23 per 1,000, whereas in the latter it was 50 per 1,000, which signifies that during middle life the death-rate of total abstainers is less than half that of those who drink even moderately. These facts emanating from so many different societies were sufficiently strong to promote the formation of a company in 1883, called the Blue Ribbon Life, Accident, Mutual and Industrial Insurance Company, Limited, which insures the lives of total abstainers only, with special benefits to them. In their last report we find

[1] In one of the later reports of this association it was stated that the death-rate of male total abstainers, between 25 and 45 years of age, was only 4 per 1,000.

that the death-rate stood at the excessively low figure of 6 per 1,000.

If the facts and figures introduced during the course of this Essay are not sufficiently convincing to the non-abstainer, it must be laid to the want of power in the writer to present them with the force and eloquence which the subject demands. But there are great and scientific writers, whose names and works have been repeatedly referred to in these pages, whose writings, if conscientiously perused, must succeed in convincing those who are still wavering. Let us not, however, be amongst the many who reject a truth because it is unpalatable, let us look it boldly in the face and clasp it unflinchingly; the recognition of truth is the only means by which progress is rendered possible, and the world is left somewhat better by each succeeding generation of thinkers and workers.

CHAPTER VI.

EDUCATIONAL AND SOCIAL ASPECTS OF THE ALCOHOL QUESTION.

Of late years public opinion has been gradually growing to the necessity of effectual legislative interference on the drink traffic, but doubtless many more years will elapse before it is ripe for practical action. In the meanwhile there is a vast deal to be done by temperance reformers in the educating of the thirty-six millions who inhabit these islands on this great question, one which in its far-reaching importance has never been surpassed. From whatever point of view we regard the temperance question, whether it be from the social, the domestic, the economic, or the scientific, the moral, mental, or physical, there we find it has struck deep roots to burrow away at and poison our national life. The advocates of temperance, by which I mean total abstinence (for personally I do not recognise any half-way house), have still a great educational work before them in thoroughly enlightening the public mind on all these different aspects of the question. It is hard to convince people theoretically; one must set before them hard practical facts which are difficult of refutation.

The hope of the present generation of temperance and social reformers must lie in the children. A great

deal may be done to reduce the habits of drinking amongst the adult population of the country—especially amongst the women, who are beginning to take a lively interest in the subject—but a large number, even the great majority, will remain untouched and unconvinced. Habits and tastes strengthen with every day of life, and that is why such a mountain of opposition bars the way of progress. The ranks of the total abstainers are *mainly* filled with those who naturally dislike Alcohol in any shape or form, with the few who have been reared in this belief, and with those whose habits are so strictly temperate that the sacrifice of relinquishing them altogether is a very slight one. There are some few who have suffered much from the sacrifice of the chronic habit, and whose position as total abstainers is therefore all the more praiseworthy ; but there are very few reformed drunkards, especially after a certain age. It will be the second and third generations from the present time which will reap the advantages of the temperance efforts of to-day.

Enlightenment is taking place in every direction, and the dictum that a healthy mind lodges only in a healthy body is beginning to be practically understood. Children are being brought up on sounder hygienic principles, and "the seed-time of health," as Dr. Richardson aptly describes it, in his excellent work on the Common Health, is now a matter of moment and consideration to parents, teachers, physicians, and philanthropists. The alcoholic customs of a generation or two ago, when children were prescribed sherry and port-wine for every passing ailment, were allowed to take wines and spirits in their hampers to school, drank beer and

ale with their meals, are passing away; and even parents who still cling to their moderate drinking, no longer countenance the use of Alcohol amongst their children. Temperance reform has already effected this vast amount of good, and it is good of a lasting and substantial order. The impressionable minds of the young are more easily influenced for good than the case-hardened minds of adults; and for this reason, the moral, mental, and physical education of children cannot be too carefully and anxiously considered.

It is during childhood that the seeds of hereditary disease can be battled with and overcome, that a healthy constitution, if not a very strong muscular physique, can be built up, and life rendered worth living. For the increased health and longevity of the individual and community, the medical profession is responsible. Within the last fifty years medicine has become a science rather than an art, because the cause of disease and its prevention can now be almost mathematically demonstrated. Given over-crowding, insufficient food, alcoholic habits, improper clothing, lack of fresh air and exercise, certain preventible diseases will be sure to crop up and promote ill-health, disease, and early death. On the other hand, rich living, alcoholic habits, want of healthy out-door exercises, lack of mental employment, late hours and fashionable clothing (or want of clothing in the great majority of instances), will also induce many ailments, and diseases of a preventible nature. And then there is the long and terrible list of hereditary diseases, and hereditary alcoholism, which brings about so much pain, misery, and premature death. These are also preventible in a large proportion of cases. The medical profession,

therefore, has ever before its view a lofty ambition, an unrivalled aim, to rid the country of disease and intemperance, to promote longevity, and to ensure physical health and happiness to as many members of the community as possible. Death will then come in the natural course of things, not through self-inflicted disease, but from the gradual decay of the different parts of the system. We shall pass as unconsciously through the narrow gate that separates life from death, as we came unknowingly into existence. The end will be a natural one, nothing more than the gradual suspension of life when all our parts have faithfully performed their work, and are worn out from long service. We cannot be proof against accidents, and these will always bring their modicum of suffering and misery; but accidents are in the most part non-preventible, as no one voluntarily seeks torture. The aim (and a loftier and nobler one can scarcely be conceived) of the medical profession, then, should be to bring about this condition of things; viz., to reduce the means of suffering, to strike unflinching blows at the several causes of disease, to prolong life, and to soften the pangs of death. Surely a nobler work was never undertaken by any class of men, and it should be regarded in the future as one of the highest privileges to devote one's life to its accomplishment.

The members of the medical profession hold an immense power in their hands, with regard to the Alcohol question. When all other means fail of touching the consciences of the masses, a doctor, by putting the plain facts of the case, in simple but forcible language, before the intelligences of the people, can effect an almost in-

stantaneous revolution. He has knowledge and experience to work upon, and the people are not so stupid—especially now-a-days—that they do not recognise the language of truth, and acknowledge the teachings of science. There is no science which can be made so interesting and fascinating for the young, and adults too, as that which teaches of the structure and functions of the human body, and no one more able to make them understood than doctors themselves. Elementary physiology should be as carefully taught in all the schools throughout the land as geography, history, or any other study considered as essential to the development of the mind. And surely the plain and simple facts of chemistry should meet with a willing ear and an open understauding. The two sciences combined would form a firm foundation of useful practical knowledge which would prove of lasting benefit to the future man and woman.

The injurious effects of intoxicating liquors upon the human system might be dealt with in the lectures on physiology, and the properties and parts of Alcohol in those on chemistry. Thus insensibly the child would come to understand that Alcohol forms no part of man's diet naturally, and that it is a wholly unnecessary and injurious addition to it, discovered by man himself from the fermentation and destruction of fruits and grain. If every child throughout the land were to receive such instruction for several years of its life, I might almost be inclined to say that the good sense of the people being awakened and stimulated, there would be no occasion for any legislation on the subject at all. The individual-liberty people might then be satisfied, and science would have won the day. But the professors of such teaching should

be adequate for their task, should be able to speak with authority, and should be chosen for their fitness. It seems to me that members of the medical profession, with their years of practical study and the peculiar advantages they have over those who get their livings in other ways, are above all suited for this particular work of education. As medicine becomes more and more a preventive science rather than a curative one, those who follow it from a love of humanity or of science will be called upon, and not improbably by the State, to teach the people how to court health and avoid disease. A member of the medical profession cannot be better employed now-a-days than in exposing the physical risks which are attached to the habit of indulgence in Alcohol; he may, by so doing, limit his chance of discovering some marvellous antidote for cancer or phthisis, but on the other hand he will be striking his axe at the root of the tree which has spread forth a hundred branches of disease.

There are not a few eminent physicians in this country who share a similar opinion about the paramount importance of sound instruction on the subject of the effects of Alcohol upon the human system. Sir William Gull says: "I am persuaded that nothing better could be done than that lecturers should go about the country instructing the people upon the disadvantages of Alcohol as it is daily used." And Sir Andrew Clark, in winding up an eloquent lecture on the same subject, said in forcible language: "Can I say to you any words stronger than these of the terrible effects of Alcohol? It is when I myself think of all this that I am disposed, as I have said elsewhere, to rush to the opposite extreme, to give up my profession, to give up everything and to go forth

upon a holy crusade, preaching to all men—Beware of this enemy of the race." Dr. B. W. Richardson, Dr. Ridge, Dr. Norman Kerr, Dr. Edmunds, and many others, are doing this work with thoroughness, energy, and earnestness; but there are thirty-six millions of understandings to reach, thirty-six millions of consciences to arouse, and the mass of the medical profession itself to be awakened to a sense of its responsibility in the matter, therefore the workers ought to be numbered by their hundreds, instead of being only counted by their tens. It may be argued by the medical profession that if the public are to be instructed about the effects of Alcohol upon the human system, why should not the teaching be extended to opium, arsenic, strychnine, etc.? Is medicine to be no longer a learned profession, confined to the few, and looked upon with something akin to awe by the many? In answer to the first question, I regard the cases as very different. Alcohol has long been one of our most prized national beverages, and looked upon as an article of daily diet; but it has been the sole parent of so many frightful physical and moral evils, that to teach the truth about its effects is not entrenching upon the particular domains of medical science, any more than instructing the people about the uses and effects of other foods and drinks would be. In answer to the second question, I would say that the less mysterious the science of medicine is made to the general public, and the more a keen interest in the questions of health is aroused by the members of the profession, the more intelligently will medical instructions be carried out by patients, and greater results obtained. The general ignorance is so awful on the most elementary facts of physiology and

chemistry, that a physician must find it very difficult, indeed, to convince his patient as to certain simple laws. Instead of addressing himself to the understanding, and appealing to the reason of his patient, he has, more often than not, to issue a set of commands, which the patient regards with more or less indifference from want of due appreciation of their importance. But when general enlightenment exists where ignorance now reigns, the public will treat the most humane and distinguished of professions with far greater confidence, courtesy, and esteem than at present; and the doctors will, through the educated intelligence of the community, achieve far more solid and brilliant results in the prevention and treatment of disease than have ever yet been attained.

The different temperance organizations, which have effected so much good throughout the country, should educate their audiences on all the many aspects of this great question. The meetings would then be made centres of educational interest, and would draw large throngs. Ministers of religion are as essentially the right persons to set the moral aspects of the question before the public mind, as doctors are to take up the physical view. This has been done in the case of clergymen of the Church of England and dissenting ministers with excellent results, but still much more can be accomplished by those who wield an immense amount of influence, and who are capable of gathering together large congregations. Surely there is no question of the present day which so needs the support of earnest workers, and those particularly professing Christianity, as this. In their work amongst the poor and the wretched, which carries them more into the homes and

lives of the masses than any other profession or calling, excepting perhaps the medical, do they not see enough of the ghastly effects of intemperance to make them even fanatical supporters of total abstinence? If Christ had lived now, instead of nearly nineteen centuries ago, would not His whole life and teachings have been directed against this national curse? There cannot be two answers to this question, and if any Christian ventured a negative, it would show that he grossly misunderstood the character, life, and death of his Saviour. No real Christian in the present day should be anything but a total abstainer; the greater the sacrifice involved in becoming one, the more earnestly should he strive to make it, to show to the world that his Christianity is still a warm and living belief with him, and not the dry husks of a dead and forgotten creed. Men of gentle manners, of refinement, and education—men who have had experience of the misery and degradation in which so many of their fellow-creatures live, are wanted to preach and practise this doctrine of total abstinence; and who more fitted than those who occupy the pulpit and exhort their hearers to live Christian moral lives? It is no use calling down anathemas upon the vices of the community if the causes which lead up to them are ignored, and it is no use condemning in others that habit which we ourselves cling to. The words are not uttered with such force of conviction, eloquence fails, the power of influence is lost. The moderate drinkers exist now, and have existed in all times; but intemperance still rages amongst us, and is still the curse of the land. Therefore those who undertake to sweep it from our midst must work with clean hands, and must be

thorough. We expect this of Christian believers and Christian workers, and we must hold their words as nought if their deeds are not in unison.

With the united efforts of the clerical and medical professions, in combination with secular workers of all kinds, amongst whom women will especially bear their burden, the temperance reform must make headway and prepare the way for legislation. Our legislators have to be educated as thoroughly on this subject by their constituents as on every other which involves the welfare of the people. No opportunity should ever be lost of bringing the question before an intending candidate for parliamentary honours, and he should be asked to publicly state his views on the various proposed remedies which have been brought, from time to time, before the consideration of the country. Members of Parliament might be more often invited to attend the temperance gatherings, when their opinions and utterances would find their way into the daily newspapers, and would thus wake the mass of the people up (who are now in the habit of sneering at temperance efforts) to the fact that the question is as much a matter of politics, therefore of the national welfare, as any other which brings its thousands together, and creates a mighty enthusiasm for freedom and right. The country wants as much to be freed from the slavery of drink as North America from the slavery of the negro; the one is as great a blot upon the nineteenth century civilization as the other; and the sooner the temperance question is thoroughly disseminated throughout the land, and the people educated to understand all its many issues, the sooner will our country know and appreciate true freedom.

And what will resnlt from this general adoption of temperance principles, and how will the nation benefit? For one thing there will be a marked decrease in individual poverty, and children will not be deprived of the bare necessaries of life, as is the case in a large majority of instances at the present time. Child-life in our big cities will be rendered more endnrable, and the frightful infant mortality, which now disgraces onr civilization, will be greatly diminished. The dirt, squalor, and filth, and rags which no other country in the world can produce in snch rank luxuriance as onrs, will find no place where temperance reigns, for there is no other source so frnitful of these things as drink. Want of self-respect, the loss of the sense of responsibility, carelessness of conseqnences, nntruthfulness, nncleanliness, indecency, and one of our most awful vices (prostitution) are amongst the direct resnlts of intemperance, and there are certain social vices which are always accompanied by and associated with drink. Gambling, horse-racing, billiard-playing (an innocent enongh amusement in itself), and prize-fighting (if it were legal here), are all accompanied by the wine-cup, and the consciences of those who gain their livings by these nefarious dealings are blunted and hardened by Alcohol. If a man loses a fortnne in any of these questionable amnsements, he drinks to drown thought; if he gains one, he drinks to show his delight; and thus King Alcohol reigns supreme, and excites all the most evil passions and worst tendencies in hnman natnre. Under a total-abstinence regimen the conscience will work with greater activity, the brain will be clearer to jndge consequences, and the mind will not consent to the performance of deeds which,

sooner or later, end disastrously. Total abstinence will not make human nature perfect, it will not quite banish all vicious propensities, all degraded passions, from our breasts, but it will leaven the mass of wickedness by which we are surrounded, and will make it "more difficult to do wrong, and more easy to do right." Fortunately human nature has never lost its desire to aim at perfection, it is this never-ceasing struggle which has developed the higher faculties, and has prevented us from sinking lower and lower to the level of the brutes. Divine reason has guided our action and moulded our lives, and thus good has always conquered over evil, and exists in the largest proportion. If it had not been thus, progress, civilization, and morality would have been non-existent, and the present day would have seen the world a chaotic mass of wretched human beings, in comparison with which Dante's Inferno would be a paradise.

There is no doubt that the habit of drinking is often contracted by young men who earn their livings in the City. Scarcely any business transaction takes place in that money-making market of the world without Alcohol being introduced to seal the bargain. And this is done several times throughout the day, and more often than not, on an empty stomach. Little wonder that the great majority of those who are "something in the City" suffer from indigestion, and a variety of other complaints, also from a blunted sense of honour and integrity. Few suburban wives and mothers know these things, are aware of the dangerous habits their husbands and sons are contracting, and great is their dismay when they find out that the bread-winner has taken to drink, or is

laid up constantly with illness, or is found to be in debt for which there seems to be no reasonable explanation. Yet these cases are happening every day, and are a necessary outcome of the current morality which passes muster amongst City men. The temptations which beset the young man on his introduction to City life, and when he sets up in business for himself, are incalculable, and he must indeed be possessed of unusual firmness of character, and have had an excellent home training, to be able to resist them, and still succeed. Total abstainers are not loved in the City; and the man who can take his glass well, and transact a pretty bit of business over it, is appreciated and looked upon as a jolly good fellow. What matter that his physical health is gradually undermined, that his *morale* becomes warped, and that he lends himself to deeds that in his sober-thinking hours he abhors,—these are matters of little moment to the tempter who wants to reap a certain advantage. And thus wags on the world in its cynical indifference: characters ruined, homes wrecked, children plunged in misery; and all because the appetite, which grows upon what it feeds, is not nipped in the bud, prevented from developing into a source of untold misery.

The increase of drinking habits amongst women, confirmed by the testimony of unbiassed witnesses before the Select Committee of the House of Lords upon Intemperance, is largely due to the fact that women are now-a-days, from force of circumstances, surrounded by the same temptations as their brothers. Barmaids are particularly open to contract habits of intemperance, and there is, unfortunately, a large amount of drinking amongst these girls, which ruins their health and brings

them to a premature grave, unless they change their calling in time. But a large number of women working for starvation wages, with no hope in life, nothing but misery and despair all around them, take to drink because it plunges them into a temporary oblivion, although it is followed by a sad and terrible awakening. It is the duty of the State to see that its members, be they men or women, are provided with sufficient means of subsistence, so as to prevent the spread of intemperance, with all its accompanying vices and crimes. Can we be surprised that drink is almost universal amongst the very poorer classes, when we look at the dwellings they inhabit, the scenes by which they are surrounded, and the absence of amusements in any shape or form. One is only surprised that under the circumstances it is not ten times worse. Such people are the bitterest foes of temperance; and the suppression of the public-houses, and the substitution in their places of cheap catering establishments, will alone bring them to consider the subject with anything like toleration.

And what sends so many working men to the public-house? The utter inability of their wives to put a decent dinner before them. The want of a knowledge of cooking has always been a national failure; the French have it almost by instinct. An Englishwoman marries without the remotest idea of the elements of cooking, and the ill-cooked dishes she places before her husband and children are a fruitful source of indigestion, for which Alcohol is taken as a cure. What does a factory girl, a shop girl, a barmaid, a general servant know of the art of cooking before she marries? Absolutely nothing, much less the prices of the different foods. The igno-

rance on such an essential matter is appalling, ending in disease, intemperance, thriftlessness (could the money wasted in the kitchens of the poor be calculated, the sum total would strike dismay into the hearts of financial reformers), waste, and misery of every description. Here again is one of the *causes* of intemperance, which might be treated with success, by educating every girl and boy in the principles of practical cooking. This would be valuable instruction, and one which would be of lasting benefit.

The public-houses must be rivalled in brilliancy, decorative work, and general attractiveness. There are few coffee-taverns that are rendered sufficiently attractive to induce working men and women to quit the public-house for them. The tea and coffee are not cheap enough, and when they are cheap are generally undrinkable. If large and influential companies were formed, with a good starting capital to work upon to cover any initial losses, a coffee-tavern might be started in every street in London and other towns, providing cheap but good drinks, a brilliantly lighted and handsomely decorated bar to take them in, and with chairs and tables where those who wanted a little relief from the monotony of business might sit and read the papers, and play chess and dominoes. And they should be kept open late, till after theatre time, and become a counter-attraction to the innumerable places where drink is sold and night brawls are a common occurrence.

By such means temperance would be made popular and attractive. At present it is shunned because it has not provided sufficient means of enjoyment. Human beings are sociable and like variety. If these natural

tendencies are not responded to, failure will be sure to result. But the time is coming on for this general national improvement, and the coffee taverns will rear their inviting fronts where now the public-houses stand with their fatal and awful attractiveness.

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